

The LADIES' Diary;

OR

WOMAN'S ALMANACK, 2

For the Year of our LORD 1789;

Being the first after BISSEXTILE, or LEAP-YEAR.

Containing New Improvements in ARTS and SCIENCES,

And many Entertaining PARTICULARS:

Designed for the *Use* and *Diversion* of the

F A I R - S E X .

The Eighth ALMANACK Published of this Kind.



VIRTUE and SENSE, with FEMALE-SOFTNESS join'd,
(ALL that subdues and captivates Mankind !)

IN BRITAIN'S Matchless FAIR resplendent shine ;

THEY rule LOVE's Empire by a Right Divine :

Justly their Charms the astonish'd World admires,

Whom *Royal* CHARLOTTE's bright Example fires.

L O N D O N :

Printed for the COMPANY of STATIONERS,

And sold by ROBERT HORSFIELD, at their Hall in Ludgate-Street.

[Price stitched, NINE-PENCE.]

Ephemerides . h.

2 CHRONOLOGY of REMARKABLE EVENTS.

Y. of Christ.	Y. since.
1600	King Charles I. born 189
1603	Q. Eliz. died, K. Ja. succ. 186
1603	A great Plague in London 186
1605	Popish Gun-powder Plot 184
1616	Shakespeare the poet died 173
1625	K. James died, Cha. I. succ. 164
1641	Bloody Irish massacre. - 148
1642	Sir I. Newton born, Dec. 25 147
1649	K. Charles I. beheaded 140
1658	Oliver Cromwell died - 131
1660	K. Charles II. restored 129
1662	Royal Society instituted 127
1665	Died of the plague 68,586 124
1666	Great fire in London - 123
1666	War against Denmark decl. 123
1667	Peace with Hol. Fr. & Den. 122
1672	War against Holland decl. 117
1672	Halfpence & Farth. coined 117
1674	Peace with Holland procl. 115
1679	Habeas Corpus act passed 110
1685	K. Cha. II. died, Ja. II. succ. 104
1688	Prince of Orange landed 101
1688	K. James II. abdicated 101
1689	Wm. and Mary crowned 100
1693	Hackney coaches established 96
1702	K. Wm. died, Q. Ann succ. 87
1702	War against France declared 87
1707	England & Scotland united 82
1713	Peace with France procl. 76

Y. of Christ.	Y. since.
1714	Q. Ann died, K. Geo. I. succ. 75
1715	Rebellion in the north - 74
1716	A very great frost - 73
1726	Sir Isaac Newton died - 69
1727	K. Geo. I. died, Geo. II. succ. 68
1739	War against Spain declared 56
1739	A very great frost - 56
1743	A great comet appeared 52
1744	War against France declared 51
1745	Rebellion in Scotland - 50
1748	A general peace - 47
1750	Westminster bridge finished 45
1752	Date and Calendar altered 43
1756	War against France declared 39
1760	K. Geo. II. died, G. III. succ. 35
1762	American philos. soc. instit. 34
1762	War against Spain declared 34
1763	Peace with France & Spain 33
1765	Otaheite discovered - 31
1770	Blackfriars bridge finished 26
1772	A revolution in Denmark 24
1772	A revolution in Sweden 24
1775	War against America begun 21
1776	America declared independent 20
1778	French treaty with America 18
1778	War against France begun 18
1779	War against Spain begun 17
1780	War against Holland begun 16
1783	A general peace - 13

BIRTH-DAYS, [N.S.] and YEARS, of the ROYAL FAMILY of GREAT BRITAIN.

KING GEORGE III. June 4, 1738
Prince of Wales, August 12, 1762
Prince Frederick, August 16, 1763
Prince William Henry, Aug. 21, 1765
Prs. Charl. Aug. Mat. Sept. 29, 1766
Prince Edward, Nov. 2, - 1767
Prs. Augusta Sophia, Nov. 8, 1768
Prs. Elizabeth, May 22, - 1770
Prince Ernest Augustus, June 5, 1771

Prince Aug. Fred. Jan. 27, 17
Prince Adolph. Fred. Feb. 24, 17
Princess Mary, April 25, - 17
Princess Sophia, Nov. 3, - 17
Princess Amelia, Aug. 7, - 17
Queen Charlotte, May 19, - 17
Prs. Augusta of Brunsw. Aug. 11, 17
Duke of Gloucester, Nov. 25, 17
Duke of Cumberland, Nov. 7, 17

YEARS of BIRTHS of the Principal SOVEREIGN PRINCES of EUROPE.

Achmet IV. Grand Seignor 1715
Charles, King of Spain, - 1716
Pius VI. Pope - - 1717
Victor Amada Maria, K. Sardinia 1726
Catherine, Empress of Russia, 1729
Stanislaus Aug. King of Poland 1732
Maria, Queen of Portugal - 1734

Joseph Ben. Aug. Emp. Germ. 1740
Fred. William, King of Prussia, 1740
Gustavus, King of Sweden, 1746
William V. Stadtholder, - 1747
Christian VII. K. of Denmark, 1747
Ferdinand IV. King of Sicily, 1759
Lewis XVI. King of France 1775

Nº	First	Full	Last	New
1	F			
2	F			
3	S			
4	D			
5	M			
6	Tu			
7	W			
8	Th			
9	F			
10	S			
11	D			
12	M			
13	Tu			
14	W			
15	Th			
16	F			
17	S			
18	D			
19	M			
20	Tu			
21	W			
22	Th			
23	F			
24	S			
25	D			
26	M			
27	Tu			
28	W			
29	Th			
30	F			
31	S			

First Quarter, 4th, 24m. past 4 aftern.
 Full Moon 11th, 46m. past 5 aftern.
 Last Quarter, 18th, 39m. past 8 morn.
 New Moon, 26th, 21m. past 6 morn.

Sun enters ♍
 19d. oh. 38m.

1	R	Circumcision	18	43	56	22	57	9	a	36	6
2	F			4	56		52	10		41	7
3	S			3	57		46	11		46	8
4	D	2 Sun. after Christmas		3	58		39		morn		9
5	M	Old Christmas Day		2	58		32	0		54	10
6	R	Epiphany: Twelfth-day		1	59		25	2		4	11
7	W			0	4	0	17	3		14	12
8	F	Lucian	7	59	1		9	4		25	13
9	F			58	2		0	5		30	14
10	S			57	3	21	51	6		26	15
11	D	3 Sun. after Epiphany		56	4		42		D rises	F	
12	M	Plow Mond. O. N. Yr's D.		55	5		32	5	a	42	17
13	R	Hil. Cam. Term begins		54	6		21	7		8	18
14	W	Orf. Term begins		52	8		11	8		31	19
15	F			51	9	20	59	9		53	20
16	F			50	10		48	11		13	21
17	S	Old Twelfth Day [Prisca		49	11		36		morn		22
18	D	2 S. af. Ep. Q. Ch. b. d. k.		47	13		23	0		30	23
19	M			46	14		11	1		45	24
20	R	Fabian. Hil. Ter. 1 return		45	15	19	58	2		55	25
21	W	Agnes		43	17		44	3		58	26
22	F	Vincent		42	18		30	4		52	27
23	F	Hilary Term begins		40	20		16	5		38	28
24	S			39	21		1	6		17	29
25	D	3 S. af. Ep. Conv. St. Paul		37	23	18	46	6		48	30
26	M			36	24		31		D sets	N	
27	R	Pr. Aug. F. b. Hil. 2 return		34	26		16	6	a	14	2
28	W			33	27		0	7		17	3
29	F			31	29	17	43	8		21	4
30	F	K. Cha. I. mart. 1649		29	31		27	9		25	5
31	S			28	32		10	10		32	6

Days	L. of D. Day Inc. D. breaks				Tw. ends		Sun East		Cl. bef. S.		7 Stars	So.		
1	7	52	0	8	5	59	6	1	4	41	4	23"	8 a	42
6		58		14		57		3		43	6	39		20
11	8	8		24		53		7		46	8	42	7	58
16		20		36		49		11		50	10	29		37
21		34		50		44		16		54	12	0		16
26		48	1	4		38		22		58	13	11	6	55

N° 86. March hath xxxi Days.

5

First Quarter, 4th, 51m. past 10 night.
 Full Moon, 11th, 50m. past 1 aftern.
 Last Quarter, 18th, 15m. past 2 aftern.
 New Moon, 26th, 46m. past 6 aftern.

Sun enters ♍
 19a. 15h. 53m.

1	D	1	Sun. in Lent	David 6	34	5	20	7	s	13	10	a	39	5
2	M		Chad		32		28	6		55	11		48	6
3	Tu				30		30			32		morn		7
4	W		Ember Week		28		32			9	0		54	8
5	Th				26		34	5		45	1		53	9
6	F				24		36			22	2		46	10
7	S		Perpetua		22		38	4		59	3		33	11
8	D	2	Sunday in Lent		20		40			35	4		10	12
9	M				18		42			12	4		42	13
10	Tu				16		44	3		48	5		11	14
11	W				14		46			25		D rises		F
12	Th		Gregory		12		48			1	7	a	39	16
13	F				10		50	2		38	9		0	17
14	S				8		52			14	10		19	18
15	D	3	Sunday in Lent		6		54	1		50	11		33	19
16	M				4		56			27		morn		20
17	Tu		St. Patrick		2		58			3	0		38	21
18	W		Edw. K. of W. Saxons		0	6	0	0		39	1		32	22
19	Th			5	58		2			16	2		16	23
20	F				56		4	0	n	8	2		55	24
21	S		Benedict		54		6			32	3		26	25
22	D		Midlent Sunday		52		8			55	3		50	26
23	M				50		10	1		19	4		13	27
24	Tu				48		12			43	4		34	28
25	W		Annunc. or Lady Day		46		14	2		6	4		53	29
26	Th				44		16			30		D sets		N
27	F				42		18			53	7	a	31	2
28	S				40		20	3		17	8		39	3
29	D	4	Sunday in Lent		38		22			40	9		52	4
30	M				36		24	4		3	10		54	5
31	Tu				34		26			26	11		56	6

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars So.
1	10	52	3 8	4 43	7 18	5 37	12 35 4 a 42
6	11	12	28	32	29	43	11 27 24
11		32	48	21	40	49	10 8 6
16		52	4 8	11	50	55	8 43 3 47
21	12	12	28	0	8 1	6 2	7 12 29
26		32	48	3 48	12	8	5 29 11

First Quarter, 3^d, 30m. past 8 morn.
 Full Moon, 9th, 24^h, past 11 night.
 Last Quarter, 17th, 50m. past 7 morn.
 New Moon, 25th, 57m. past 9 morn.

Sun enters 8
 19d. 4h. 38m.

1	W		5	32	6	28	4n	49	morn
2	Th			30		30	5	12	0 51
3	F	Richard. Cam. Ter. ends		28		32		35	1 38
4	S	St. Ambrose. Cof. T. ends		26		34		58	2 16
5	D	Palm Sun. Old Lady day		24		36	6	21	2 50
6	M			22		38		44	3 19
7	Tu			20		40	7	0	3 45
8	W			18		42		28	4 10
9	Th	Maundy Thursday		17		43		51	Drises
10	F	Good Friday		15		45	8	13	7 a 58
11	S			13		47		35	9 16
12	D	Easter Day		11		49		57	10 26
13	M	1 st after Monday		9		51	9	18	11 29
14	Tu	Easter Tuesday		7		53		40	morn
15	W			5		55	10	1	0 19
16	Th			3		57		22	1 0
17	F			1		59		43	1 33
18	S								
19	D	Low Sunday. <i>Alpbge</i>	4	59	7	1	11	4	2 0
20	M			57		3		25	2 24
21	Tu			56		4		46	2 46
22	W	Orf. and Cam. T. begins		54		6	12	6	3 5
23	Th	St. George.		52		8		26	3 24
24	F			50		10		46	3 45
25	S	St. Mark. Frs. Mary b. 1770		48		12	13	6	4 6
26	D	2 ^d Sunday after Easter		46		14		25	D sets
27	M	Easter Term 1 return		45		15		44	8 a 50
28	Tu			43		17	14	4	9 56
29	W	Easter Term begins		41		19		22	10 53
30	Th			39		21		41	11 43
				37		23		59	morn

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun Ent	Cl. bef. S.	17 Stars					
1	12	56	5	1	3	33	8	28	6	15	3' 48"	2 a 4
6	13	16		3		20		41		21	2 18	
11		34		50		6		55		27	0 53	
16		54	6	10	2	54	9	7		33	0 a 24	1
21	14	12		28		40		21		39	1 31	
26		30		46		23		38		45	2 27	

First Quarter, 2d, 2m. past 3 aftern.
 Full Moon, 9th, 22m. past 9 morn.
 Last Quarter, 17th, 44m. past 1 morn.
 New Moon, 24th, 20m. past 10 night.
 First Quarter 31st, 44m. past 7 night.

Sun enters II
 zod. 5h. 13m.

1	F	St. Philip & James	4	36	7	24	15	n	17	om	23	7
2	S	[of the Cross]	34	26					35	o	57	8
3	D	3 S. aft. Easter. Invention	32	28					53	1	27	9
4	M	Easter Term 2 return	31	29	16	10			1	53	10	
5	Tu		29	31		27			2	17	11	
6	W	John Ev. ante Port. Lat.	27	33		44			2	42	12	
7	Th		25	35	17	1			3	7	13	
8	F		24	36		17			3	37	14	
9	S		22	38		33			D rises	F		
10	D	4 Sunday after Easter	21	39		48			9 a	17	16	
11	M	Easter Term 3 return	19	41	18	4	10		12		17	
12	Tu	Old May Day	18	42		19	10		56		18	
13	W		16	44		33	11		35		19	
14	Th		14	46		48			morn		20	
15	F		13	47	19	2	o		5		21	
16	S		12	48		16	o		29		22	
17	D	Rogation Sunday	10	50		29	o		51		23	
18	M	Easter Term 4 return	9	51		42	1	10			24	
19	Tu	Queen Char. born Danstan	7	53		55	1	30			25	
20	W		6	54	20	8	1	50			26	
21	Th	Ascension or Holy Thurs.	5	55		20	2	14			27	
22	F	Prs. Eliz. b. Easter Term	3	57		32	2	36			28	
23	S	[5 return	2	58		43	3	4			29	
24	D	Sunday after Ascension	1	59		54			D sets	N		
25	M	Easter Term ends	0	8	0	21	5	8 a	52		2	
26	Tu	Augustin 1st Abp. Cant.	3	58		2	15	9	39		3	
27	W	Venerable Bede	57	3		25	10	23			4	
28	Th	Orf. Term ends	56	4		35	10	59			5	
29	F	K. Cha. II. Restored 1660	55	5		44	11	30			6	
30	S		54	6		53	11	57			7	
31	D	Whit Sunday	53	7	22	1		morn			8	

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars So.							
1	14	48	7	4	2	4	9	58	6	50	3	11"	o a	57
6	15	6		22	1	50	10	12		55		42		38
11		22		38		28		34	7	o		58		19
16		36		54		4		59		4	o		11 m	59
21		50	8	8	o	24	11	41		8	3	48		40
26	16	4		22	No real Night					12		21		20

Full Moon, 7th, 17m. past 8 night.
 Last Quarter, 15th, 5m. past 7 night.
 New Moon, 23d, 5m. past 8 morn.
 First Quarter, 29th, 10m. past 12 night.

Sun enters ϖ
 20d 13h. 55m.

1	M	Whit Monday	<i>Nicomede</i>	3	52	8	8	22	10	0	m	21	9
2	Tu	Whit Tuesday			51		9		17	0		46	10
3	W	Ember Week			51		9		25	1		10	11
4	Th	K. Geo. III. b. 1738.			50		10		32	1		36	12
5	F	Pr. Er. Aug. b. 1771. <i>Bonif.</i>			49		11		38	2		7	13
6	S				48		12		44	2		43	14
7	D	Trinity Sunday			48		12		50	D	rises	F	
8	M	Trin. Term 1 return			47		13		55	8	a	47	16
9	Tu				46		14	23	0	9		29	17
10	W	Ort. Term begins			46		14		5	10		2	18
11	Th	St. Barnabas. Corp. Chris			45		15		9	10		29	19
12	F	Trinity Term begins			45		15		13	10		52	20
13	S				44		16		16	11		12	21
14	D	1 Sunday after Trinity			44		16		19	11		31	22
15	M	Trin. Term. 2 return			44		16		21	11		50	23
16	Tu				43		17		24		morn		24
17	W	St. Alban							25	0		16	25
18	Th								27	0		33	26
19	F								27	0		59	27
20	S	Transf. Edw. K. W. Sax.							28	1		30	28
21	D	2 Sun. aft. Trin. L. Day							28	2		9	29
22	M	Trin. Term 3 return							27	2		58	30
23	Tu								27	D	fets	N	
24	W	Nativ. of St. J. Bapt. Mids.							25	8	a	51	2
25	Th				43		17		24	9		28	3
26	F				43		16		22	9		56	4
27	S				44		16		19	10		21	5
28	D	3 Sun. after Trin.			44		16		17	10		45	6
29	M	St. Peter. Trin T. 4 return			44		15		13	11		9	7
30	T				45		15		10	11		34	8

Days	L. of D.	Day Inc.	D. breaks	Tw. ends	Sun East	Cl. aft. S.	7 Stars Sol
1	16	16	8	34		7	16
6		24		52	No night, but		18
11		30	9	8	constant day		19
16		34		22	or twilight.		20
21		34		22			21
26		32	dec. 2				20
						2	23
						2	35
						1	45
						0	49
						0	54
						1	19
						2	23
						10	m
						10	m
						15	
						15	
						53	
						13	

m.

Full Moon, 7th, 31m. past 8 morn.
 Last Quarter, 15th, 21m. past 11 morn.
 New Moon, 22d, 1m. past 4 aftern.
 1st Quarter, 29th, 20m. past 6 morn.

Sun enters ♏
 22d. oh. 44m.

9	1	W	Trinity Term ends	3	46	8	14	23	n	6	morn	9
10	2	Th	Visitation of Virgin Mary	46	14			1	0	6		10
11	3	F	Dog Days begin	47	13	22	56	0	37			11
12	4	S	Translation of St. Martin	4	1		51	1	18			12
13	5	D	4 S. aft. Tr. Old Midf. day	48	12		45	2	10			13
14	6	M		4	11		3	3	2			14
F	7	Tu	Thomas a Becket. Camb. C	49	11		3	Drises				F
16	8	W		5	10		26	8 a	25			16
17	9	Th		51	9		10	8	5			17
18	10	F	Camb. Term ends	52	8		11	9	12			18
19	11	S		53	7		3	9	32			19
20	12	D	5 Sun. after Trin.	54	6	21	55	9	5			20
21	13	M	Oxford Act	55	5		46	10	11			21
22	14	Tu		56	4		37	10	31			22
23	15	W	Switbin	57	3		2	10	55			23
24	16	Th		58	2		17	11	24			24
25	17	F		59	1		7	11	58			25
26	18	S	Oxf. Term ends	4	0	20	57	morn				26
27	19	D	6 Sun. aft. Trinity	2	7	58	46	0	42			27
28	20	M	Margaret	3	57		34	1	3			28
29	21	Tu		4	56		2	2	42			29
30	22	W	Magdalen	5	5		11	D sets				N
N	23	Th		7	5	19	58	7 a	54			2
2	24	F		8	52		46	8	22			3
3	25	S	St. James	10	5		33	8	48			4
4	26	D	7 Sun. aft. Trin. St. Anne	11	49		19	9	11			5
5	27	M		12	48		6	9	37			6
6	28	Tu		14	46	18	52	10	6			7
7	29	W		15	4		38	10	38			8
8	30	Th		17	43		23	11	17			9
	31	F		18	42		8	morn				10

So.	Days	L. or D.	Day dec.	D breaks	Tw. ends	Sun East	Cl. bef. S.	7 Stars	So.
55	1	16	28	0	6	7	19	3' 23"	8 m 52
35	6		22		12		18	4	17
15	11		14	20	No real Night	15	5	1	11
56	16		4	30		12		34	7
53	21	15	52	42		9		56	31
13	26		38	56	0 52 11 4	5	6	3	11

10

August hath xxxi Days.

1789.

Full Moon, 5th, 27m. past 10 night.
 Last Quarter, 14th, 5m. past 2 morn.
 New Moon, 20th, 18m. past 11 night.
 First Quarter, 27th, 14m. past 3 aftern.

Sun enters μ
 22d. 7h. 3m.

1	S	Lammas Day	4	20	7	40	17	53	0	m	2	11
2	D	8 Sunday after Trinity		22		38		38	0	55		12
3	M			23		37		22	1	53		13
4	Tu			25		35		6	2	55		14
5	W			26		34	16	50				15
6	Th	Transfiguration		28		32		33	7	a	17	16
7	F	Prs. Amelia b. 1783. Name		30		30		16	7	38		17
8	S	[of Jesus]		31		29	15	59	7	58		18
9	D	9 Sunday after Trinity		33		27		42	8	17		19
10	M	St. Lawrence		35		25		24	8	38		20
11	Tu	Prs. Brunf. b. Dog D. e.		37		23		6	9	0		21
12	W	Pr. Wales b. O. Lam. day		38		22	14	48	9	28		22
13	Th			40		20		30	9	59		23
14	F			42		18		11	10	40		24
15	S	Assumption		44		16	13	53	11	26		25
16	D	10 Sun. aft. Trin, Duke of		45		15		33		morn		26
17	M	[York born 1763]		47		13		14	0	23		27
18	Tu			49		11	12	55	1	32		28
19	W			51		9		35	2	50		29
20	Th			53		7		15		D sets		30
21	F	Pr. Wm. Hen. b. 1765		54		6	11	55	6	a	50	31
22	S			56		4		35	7	18		32
23	D	11 Sunday after Trinity		58		2		15	7	44		33
24	M	St. Bartholomew	5	0		0	10	54	8	12		34
25	Tu			2	6	58		33	8	43		35
26	W			4		56		12	9	22		36
27	Th			6		54	9	51	10	7		37
28	F	St. Augustine		8		52		30	10	57		38
29	S	Beheading of John Baptist		9		51		9	11	53		39
30	D	12 Sunday after Trinity		11		49	8	47		morn		40
31	M			13		47		25	0	54		41

Days	L. of D.	Day dec.	D. breaks	1w. ends	Sun East	Cl. bef. S.	7 Stars						
1	15	20	1	14	1	24	10	34	7	0	5' 53"	6	47
6		4		30		44		14	6	55	5	24	2
11	4	46		48	2	2	9	56		50	4	43	9
16		30	2	4		20		39		44	3	49	5
21		12		22		35		24		39	2	42	31
26	13	52		42		50		0		33	1	23	13

N^o 86. September hath xxx Days

11

Full Moon, 4th, 7m. past 2 aftern.
 Last Quarter, 12th, 54m. past 2 aftern.
 New Moon, 19th, 6m. past 7 morn.
 First Quarter, 26th, 48m. past 3 morn.

Sun enters ♈
 22d. 3h. 28m.

1	Tu	Giles	5	15	6	43	3	n	3	1m	59	13
2	W	London burnt 1666		17		42	7	42	3	5	14	
3	Th			19		41	1	4	10	F		
4	F			21		3	6	57	Drifst		16	
5	S			23		37	35	6	2	30	17	
6	D	13 Sunday after Trinity		25		35	13	6	52	18		
7	M	Enurebus		27		33	5	50	7	15	19	
8	Tu	Nativity of the V. Mary		29		31	27	7	39	20		
9	W			31		29	5	8	9	21		
10	Th			32		28	4	42	8	45	22	
11	F			34		26	10	9	23	23		
12	S			36		24	3	56	10	21	24	
13	D	14 Sunday after Trinity		38		22	3	11	25	25		
14	M	Hely-Crofs		40		2	10	morn		26		
15	Tu			42		1	2	47	0	36	27	
16	W	Ember Week		44		16	24	1	52	28		
17	Th	Lambert		46		14	0	3	15	29		
18	F			48		12	1	37	4	38	30	
19	S			5		10	14	D	fets	N		
20	D	15 Sunday after Trinity		52		8	0	5	6	a	21	2
21	M	St. Matthew		54		6	27	6	52	3		
22	Tu	K Geo. III. crown. 1761		56		4	3	7	28	4		
23	W			58		2	0	20	8	10	5	
24	Th		6	0		0	44	9	0	6		
25	F			2	5	58	1	7	9	56	7	
26	S	St. Cyprian		4		56	30	10	57	8		
27	D	16 Sunday after Trinity		6		54	54	morn		9		
28	M			8		52	2	17	0	1	10	
29	Tu	St. Mich. Prs. Ch.A.M. b.		10		50	4	1	7	11		
30	W	St. Jerome		12		48	3	4	2	12	12	

Days	L. of D.	Day	dec.	D. o. eakst	v. w. ends	Sun East	Cl. ut. S.	7 Stars	So.					
1	13	30	3	4	3	7	8	52	6	27	0	24	4 m	51
6		10		24		21		33		20	2	2		33
11	12	52		44		34		25		14	3	44		15
16		32	4	2		45		14		8	5	23	3	57
21		12		22		59		3		2	7	12		40
26	11	52		42	4	7	7	52	5	55	8	54		20

Full Moon, 4th, 5m. past 7 morn.
 Last Quarter, 12th, 37m. past 1 morn.
 New Moon, 18th, 19m. past 4 aftern
 First Quarter, 25th, 8m. past 8 night

Sun enters m
 22d. 11h. 24m.

1	Th	Remigius	6	14	5	40	3s	27	3m	17	13
2	F			16		44	5	4	21	14	
3	S			18		42	4	14	5	25	15
4	D	17 Sunday after. Trin.		20		40	37		Drises	F	
5	M			22		38	5	0	5a	53	17
6	Tu	Faith		24		36	23	6	22	18	
7	W			26		34	40	6	55	19	
8	Th			28		32	6	9	7	36	20
9	F	St. Denys	Mic. Day	29		31	32	8	24	21	
10	S	Orf. and Ca. T. b. [Old		31		29	5	9	21	22	
11	D	18 Sunday after Trin.		33		27	7	17	10	29	23
12	M			35		25	40	11	40	24	
13	Tu	Transf. of K. Edw. Conf.		37		23	8	3	morn	25	
14	W			39		21	25	0	59	26	
15	Th			41		19	4	2	19	27	
16	F			43		17	9	9	3	40	28
17	S	Etbeldred		45		15	31	5	2	29	
18	D	19 Sun. aft. Trin. St. Luke		47		13	53		D sets	N	
19	M			49		11	10	15	5a	29	2
20	Tu			51		9	5	6	10	3	
21	W			53		7	5	6	56	4	
22	Th			55		5	11	19	7	51	5
23	F			56		4	4	8	52	6	
24	S	[III. Acces.		50		2	12	1	9	56	7
25	D	20 Sun. af. Trin. K. Geo.	Griff	50		0	22	11	0	8	
26	M	K. Geo. III. Procl. 1700		7	24	5	42	morn		9	
27	Tu			4		5	3	2	0	6	10
28	W	St. Simon and Jude		6		54	23	1	12	11	
29	Th			8		52	42	2	15	12	
30	F			9		5	4	2	3	20	13
31	S			11		4	22	4	25	14	

Days	L. or D.	Day	Sec.	D. breaks	W. days	Sun Ent	Cl. aft.	Stars	Sun					
1	11	32	5	2	4	10	7	4	5	49	10'	32"	3 m	4
6		12		22		29		30		43	12	2	2	46
11	10	54		40		39		20		37	13	22		27
16		34	6	0		49		10		31	14	28		8
21		14		20		59		0		25	15	20	1	50
26	9	56		38	5	8	6	51		19	15	56		29

Full Moon, 2d, 22m. past 12 night.
 Last Quarter, 10th, 30m. past 10 morn.
 New Moon, 17th, 29m. past 3 morn.
 First Quarter, 24th, 42m. past 3 aftern.

Sun enters ♄
 21d. 7h. 37m.

1	D	21 Sun. af. Tr. All Saint	7	13	4	47	14	41	5m 30	15
2	M	Prince Edward b. <i>All Souls</i>		15		45	15	0	D rises	F
3	Tu	Prs. Soph. b. Mic. T. 1 ret.		17		43		19	5 a 1	17
4	W			18		42		37	5 38	18
5	Th	Powder Plot, 1605		20		40		55	6 25	19
6	F	Leonard. Mich. Ter. beg.		22		38	16	13	7 10	20
7	S	Duke of Cumb. b. 1745		24		36		31	8 21	21
8	D	22 S. af. T. Prs. A. So. b		25		35		48	9 32	22
9	M	Ld. Mayor's Day at Lond.		27		33	17	5	10 46	23
10	Tu			29		31		22	morn	24
11	W	St. Martin		30		30		39	0 3	25
12	Th	Mich. Term 2 return		32		28		55	1 21	26
13	F	<i>Britius</i>		33		27	18	11	2 41	27
14	S			35		25		26	4 1	28
15	D	23 Sun. af. Tr. Macbutus		37		23		42	5 22	29
16	M			38		22		57	6 40	30
17	Tu	Hugh Bp. of Lincoln		40		20	19	11	D sets	N
18	W	Mich. Term 3 return		41		19		26	5 a 34	2
19	Th			42		18		39	6 33	3
20	F	Edmund K. and M.		44		16		53	7 37	4
21	S	[Old Mart. day		45		15	20	6	8 42	5
22	D	24 Sun. aft. Trin. Cecilia.		47		13		19	9 49	6
23	M	St. Clement		48		12		31	10 55	7
24	Tu			49		11		44	morn	8
25	W	D. Glou. b. Catharine. Mi.		51		9		55	0 0	9
26	Th	[Term 4 re		52		8	21	6	1 4	10
27	F			53		7		17	2 7	11
28	S	Mich. Term ends		54		6		28	3 11	12
29	D	Advent Sunday		55		5		38	4 16	13
30	M	St. Andrew		56		4		48	5 21	14

Days	L. or D.	Day dec.	D. breaks	1w. ends	Sun. Ears	Cl. aft. S.	7 Stars So.
1	9	34	7	0	5	12	16' 14"
6		16		18		7	8
11		0		34		1	15 40
16	8	44	50	37	4	57	14 51
21		30	8	4		52	13 40
26		16		18		49	12 11
							1 m 4
							0 44
							24
							3
							11 a 42
							21

Full Moon,	2d, 39m. past	4 aftern.	Sun enters ♋ 20d. 19h. 59m.
Last Quarter,	9th, 17m. past	6 aftern.	
New Moon,	16th, 43m. past	4 aftern.	
First Quarter,	24th, 11m. past	1 aftern.	

1	Tu		7	57	4	3	21	57	6m 26	15
2	W			58		2	22	6	☽ rises	16
3	Th			59		1		14	5 a 6	17
4	F		8	0	0			22	6 9	18
5	S			1	3	59	29	7	16	19
6	D	2 Sun. in Advent. Nicholas		2		58	36	8	29	20
7	M			3		57	43	9	44	21
8	Tu	Conception of V. Mary		3		57	40	11	1	22
9	W			4		56	55		morn	23
10	Th			5		55	23	0	0 18	24
11	F			5		55		5	1 37	25
12	S			6		54		10	2 53	26
13	D	3 Sunday in Advent. Lucy		6		54		13	7 11	27
14	M			7		53		17	5 24	28
15	Tu	[Term. ends		7		53		20	6 33	29
16	W	Ember Week Sap. Cam.		7		53		22	☽ sets	N
17	Th	Orf. Term ends		8		52		24	5 a 0	2
18	F							26	6 12	3
19	S							27	7 20	4
20	D	4 Sunday in Advent						28	8 26	5
21	M	St. Thomas. Shortest Day						28	9 32	6
22	Tu							28	10 36	7
23	W							27	11 39	8
24	Th			8		52		26	morn	9
25	F	Christmas Day		7		53		24	0 43	10
26	S	St. Stephen		7		53		22	1 45	11
27	D	St. John. S. aft. Christ.		7		53		19	2 51	12
28	M	Holy Innocents		6		54		16	3 55	13
29	Tu			6		54		12	5 0	14
30	W			6		54		8	5 56	15
31	Th	Silvester		5		55		4	6 49	16

Days	L. of D.	Day dec.	D. break	Tw. ends	Sun East	Cl. aft. S.	7 Stars So
1	8 6	8 28	5 54	6 0	4 45	10' 23"	11 a 0
6	7 56	38	56	4	43	8 20	10 38
11	50	44	58	2	41	6 5	16
16	46	48	0	0	40	3 39	9 54
21	44	50	1	5 59	39	1 9	32
26	46	o inc. 2	0	6 0	40	1b. 21	10

CHRONOLOGICAL NOTES, &c. in 1789.

Dominical Letter	D	Roman Indiction	7	Easter Day	April 12
Golden Number	4	Septuage. Sun.	Feb 8	Ascension Day	May 21
Epact	3	Shrove Sunday	Feb. 22	Whit-Sunday	May 31
Cycle of the Sun	6	Lent begins	Feb. 25	Advent-Sun.	Nov. 29

ECLIPSES, &c.

THERE will be four eclipses this year; two of the Sun, and two of the Moon.—I. The Moon is eclipsed May 9, invisible.—Begins 8h. 38m. in the morning; middle 9h. 31m. ends 10h. 24m. digits eclipsed $2^{\circ} 54'$ on the ☾'s north limb.—II. The Sun is eclipsed May 24, at 10h. 20 $\frac{1}{2}$ m. invisible. III. The Moon is eclipsed Nov. 2, visible; begins 11h. 28m. at night; middle 12h. 32m. end 1h. 37m. next morn. digits ecl. $3^{\circ} 40'$ on the ☾'s south limb. IV. The Sun is eclipsed Nov. 17, invisible. The conjunction at 3h. 29m. morning.

VENUS is a morning star till May 20; then an evening star to the end.

JUPITER is a morning star till Jan. 14, then an evening star till Aug. 2, then a morning Star.

There will also be a transit of the Planet Mercury this year, over the face of the Sun, on the 5th of Nov. in the afternoon. It begins at 1h. 10m. and ends at 6h. 4m.—*We refer to our Supplement for an account of such transits, with a type of the present one, as also a type of the visible eclipse of the Moon on the 2d of November.*—A COMET is also expected to appear about the beginning of the year.

ANSWERS to the ENIGMAS.

1 Fashion	4 Air	7 Envy	10 Ladies Diary
2 Bird nest	5 Echo	8 Night	11 Candle
3 Millstone	6 Fir-Tree	9 Smoke	12 or Prize, Fancy.

Answers to the Prize Enigma.

1. Laura's Address to Mr. Robert Richardson, of Frosterly.

And wilt thou, Richardson, dear long-lov'd name!
 Arouse a-fresh my half-extinguish'd flame;
 Command thy "tow'ring muse" from pole to pole,
 And touch the string that shakes my inmost soul!
 Fancy! lov'd, fatal theme! thy power alone
 Bids drooping reason quit her tott'ring throne;
 The exil'd senses mourn thy wayward sway,
 And nature starts, yet owns she must obey.

Too cruel youth! yet blameless may'st thou shine;
 Joy be thy portion, fell despair be mine!
 Quixotic madness urg'd me to declare
 The lov'd dear source of all my hope and care;
 That declaration, and thy juster scorn,
 Leave my sad heart with ev'ry passion torn.
 Yet blame not, fair diarians, him whose eyes
 Know not the wretch who thus in anguish sighs.
 Farewell! I fly, an hapless love-lorn maid!
 And ling'ring shrink behind oblivion's shade.

2. *Addressed to Mr. R. Richardson, by Mr. William Evans.*

Do thou, sweet bard, whose soaring genius can
The mazy flights of fancy justly scan,
Resume once more thy soft harmonious strain,
To all the silent tribe of Dia's train;
That wont to deck her page with branching bays,
Their honour, and our admiration raise.
For I, with Mrs. Lean, exclaim and grieve,

* "They've ceas'd to write, ah have they ceas'd to live."

* See her general answers in 1784.

3. *Sylvanus's Address to Miss Nancy S—, who desired him to answer the P. E.*

Fancy never feign'd a face,	Not with all its necromancy,
Art could never shew such grace,	Charms so sweet as thine dear Nancy:
Yours alone can fill my Fancy.	

4. *The same answered by Mr. R. G. West.*

Phebus had ting'd the glowing east,	Taught by her song, my voice I'll raise,
The lark had left her mossy nest,	In grateful hymns of sacred praise,
And soaring reach'd the sky;	To heav'n's almighty king.
So sweet she tun'd her matin lay,	Up then, my soul, with seraphs join,
That fancy whisp'ring seem'd to say,	Extol his mighty power divine,
She joins the choir on high.	Who gave thee voice to sing.

5. *Mira's Despair.*

Mentor is gone! my guardian, lover, friend;
Nor time nor chance can the lov'd youth restore.
Ye pleasing *Visions*, now you're at an end,
For I must see his angel form no more.

6. *The Answer by Mr. George Lodge, of Linton.*

How blest the man whose *thoughts* need no disguise;
His practice virtue, endless bliss his prize.

7. *By Miss Eliza Dillotson, of Harfebeath, near Linton.*

How blest the humble mind when wrapt in *thought*,
Of what to man the greatest comfort brings;
How with his blood, Christ our redemption wrought,
And seal'd our pardon with the king of kings.

8. *By Master John Pyches, of Linton Academy.*

Happy the bard whose skill is here display'd,
Veiling his *fancy* thus in masquerade.

9. *By Mr. Matthew Jackson, of Towersey, Bucks.*

"Of all the various ills that men lament,
How few are those which care might not prevent!"
Nor vain the precept; by experience taught,
Too late we learn, they spring from want of *thought*.

10. *By Mr. Robert Allanson, of Middleton, Yorkshire.*

Long time I study'd to unfold the prize,
So well conceal'd, and hid in dark disguise.
On downy pinions *fancy* took her flight,
And brought the latent object into sight.

11. *By Mr. Tho. Nield, Writing Master, of Hawarden School.*

With *mus'ing* thoughts profound I scan'd your prize;
And *Fancy's* self came strait before my eyes.

12. *The same answered in an Epigram, by Mr. T. W. Leicesters*

Two juvenile poets, at Bacchus's shrine,
Imagining wit was enliven'd by wine,
Too freely had tippled the stores of the barrel,
And with stigmas thrown out had near come to a quarrel.
Says one, when you with your stiff verses to shine,
You haste to some author, and there crib a line:
But you, says the other, for want of instruction,
Not content with a line, steal all his production.

GENERAL ANSWERS to the ENIGMAS.

1. *On Winter; by Mr. Rob. Allanson, of Middleton, Yorkshire.*

Adieu, to flow'ry meads and groves,
To rural scenes, and gay alcoves;
No more the birds their *nests* prepare,
Nor fill with harmony the *air*,
The lily and the fragrant rose
Their beauties now no more disclose;
These pleasing prospects disappear,
And winter *nights* are now severe,
Rude tempests *echo* thro' the plains,
And bind the *mill* in icy chains.
No more the rural nymphs are seen
To trip along the verdant green,
Nor harmless shepherds in the grove
Are heard to sing *loft* tales of love;

But to the *village* they retire,
Where, seated round the chearful *fire*,
They pass their time in sweet content,
Read *Lady Di*, and *Supplement*.
Such *matchless* concord they possess,
That scandal dreads to shew her face,
And *envy's* banish'd from the place.
No *fancy'd fashions* ere perplex,
Or prompt the minds of either sex.
Thus with content the minutes pass,
While each *blich* swain surveys his
 lafs,
His pipe he *smokes*, and drinks his
 glafs.

2. *The LADIES DIARY, or Journal of a Day, by Miss Sally Browne.*

First in the morning, when I *wake*,
It is my constant care,
To dedicate my soul to God,
In supplicating pray'r.

Imploring his efficient grace
To guide me through the day;
To keep my *thoughts* and steps a-
 right,

Throughout the devious way.

My morning orisons perform'd,
I then an *airing* take,
Far as yon' *mill*, or yonder *grove*,
Where *envy* dare not wait.

Returning home with mind enlarg'd,
On Providence reflect;
Whose finger taught the birds to build,
Their *nestlings* to protect,

The scaly tribe, the ravenous beast,
Thou, Lord, provid'st for all!
And says, without thy knowledge, not
One sparrow ere doth fall.

The day advancing, I advance,
And constantly employ
The *busy needle* to its task;
Which yields me double joy.

No *noisy smoker* ere intrudes
Upon my happy time;
Nor booby 'squire, by father sent,
With, ' Miss—will—you—be—
 mine.'

The *night* arriv'd, I finish it,
As I began the day;
' Knowing the *fashion* of the world
Is gliding swift away.'

3. Lucy's Downfall; by Miss Alexia Corney *.

No more I hail the rosy morn,
 Or twine the flow'ry wreath;
 For Lucy, from my bosom torn,
 Is in the arms of death.
 Alas! poor Lucy, hapless maid,
 Thou sigh'd, but sigh'd in vain,
 And 'neath the fir-tree's spreading
 Did to the air complain. [shade,
 Deceitful Damon won her heart;
 She fancy'd him sincere;
 She envy'd not the rich or great,
 Damon was all to her.
 Till vain of conquest, foolish youth,
 By pride too surely won,
 Forgot his vows and oaths of truth,
 And Lucy was undone.
 One eve, as late we sought the grove,
 Her eyes began to flow,

Her throbbing breast heav'd sighs of
 And *echo* mock'd her woe. [love,
 ' Behold, she cry'd, the *smoking* coe,
 Beside yon clacking mill,
 Where first he told his pleasing tale,
 Nor dreamt I then of ill.
 I dress'd myself with nicest art,
 To please the charming swain;
 His smiles beguild my flutt'ring
 The cause of all my pain. [heart,
 Alas! fond youth, thy broken vows
 I ever must repeat,
 And mourn beneath the shady bough,
 Where tuneful nestlings meet.
 Excuse, *Diarian* friends, the maid
 Who strives the tale to tell,
 How Lucy shone as candle bright,
 But, ah! too soon she fell.

* The Author thanks this ingenious young Lady for her amusing little anecdote, to the subject of which he heartily wishes a happy success.

4. The same, answered by Mr. Thomas Eland.

Dear Di, my painful cause support,
 Say, shall I leave, or shall I court,
 The false bewitching Smales:
 Once she had flattering thoughts of me,
 And sigh'd and wish'd my face to see,
 But ah! how chang'd her tales.
 Now by a youth and dress inspir'd
 She flies from me she once admir'd,
 Nay once resign'd her hand;
 With *smoke* her words may well compare,
 These lost in *sound*, and that in *air*,
 Or letters wrote on sand.
 Oh! cruel maid, why thus forsake
 The youth who only lives to make
 You happy all your life;
 Snug in some little country nest,
 How would my days and nights be
 blest'd,
 Could I but call you wife.

Must I forsake you then?—I must;
 My muse, provok'd, cries out 'tis just;
 Forget you then I will:
 My suit in future shall be paid
 To some more faithful constant maid
 Some 'Patty of the Mill.'
 You with your swain, I with my
 lass,
 Together trip the verdant grass,
 Or rest beneath the shade;
 Where lofty *fir*, and spreading oak,
 Would see us toy, and hear us joke,
 And hide the blushing maid.
 Scandal with us shou'd have no place
 But baleful *envy* hide her face,
 And joy inspire each breast;
 Each evening too in peace we
 spend,
 Till wasting *candle's* near its end,
 Then calmly sink to rest.

5. The same answered by Maria.

Far remote from crowded courts,
 Far from *fashion's* splendid seat,

Far from folly's gay resorts,
 Let me find a calm retreat.

Let a palace proudly swelling,
 Or a cot in deserts drear;
 Let not *envy* eye the dwelling,
 Nor contempt with frown severe.
 Seated in a pleasant valley,
 Where no city's *smoke* molest:
 In the *firs* and bushes near me
 Let the warblers build their *nest*.

Here a stream from yonder corn mill
 Gently *wind* its course along.
 There sweet *echo* from the hill
 Kindly answer to my song.
 When *night* draws her sable round me,
 And *tapers* light supply the day,
 Then let *Gent's* or *Ladies Diary*
 Fancy's magic power display.

6. The same by Miss Betty Smales.

Let me wander up the hill,
 Down the vale, or by the mill,
 By the gentle falling floods,
 Thro' the cool sequester'd woods,
 New *dress'd* groves and bow'ry mazes,
 And o'er hillocks deck'd with daisies;
 Whilst the air on zephyr's wing,
 Wafts the odours of the spring;
 And the plowman whistling round,
 Turns the *reeking* fallow ground;
 And the shepherds wind their flutes,
 And the virgins strike their lutes,
 And the *nestling* warblers sing,
 And *responsive* valleys ring:

Here *unenvy'd* let me dwell,
 In some moss-grown rural cell;
 And while pleasure melts the lay,
 With the tuneful sisters play;
 Nature thou hast charms for me,
 This is true reality.—
 Ye that revel thro' the *night*,
 By the glimm'ring *taper's* light,
 Fond of gay *fantastic* toys,
 Pleas'd with visionary joys,
 Would you taste of true content,
 Give your mirth a *supplement*;
 Come and share the bliss with me;
 This is sweet reality.

7. The same answered by Mr. J. Walton, of Allen Town.

How sweetly *enchanting* is spring,
 When nature enlivens the scene?
 How pleasing each prospect in May,
 When flow'rets enamel the green?
 That's all the gay bustle of state,
 Compar'd with the joys of the field,
 Where health and contentment reside,
 What true satisfaction can yield?
 Then happy the man who obtains
 These solid enjoyments of life,
 Where peace with tranquility reigns,
 And love that's unfully'd with strife.
 No greater ambition he knows,
 Than view the rich crops of his
 ground,
 While melody hovers in air,
 And *echo* redoubles the sound.

At *night* honest Bess with a smile
 Awaits the return of her mate,
 Whom no gaudy ribbons adorn:
 Unenvy'd's the pomp of the great.
 His florid young offspring relate,
 How down in the brake by the mill,
 Such nestlings, and *nests* they had
 found,
 Along by the side of the hill.
 While Betty *smokes* over the floor,
 And quick brings her best homely fare,
 Her *matches* or candles she minds;
 Her scanty repast is not rare.
 No *Diary* riddles they mind,
 Nor Editor's pleasing address;
 Their bible is solely their guide,
 In virtue to finish their race.

8. Mr. Gradidge, of Canterbury, thus answers the same.

The shortest answer pleaseth best:
 Then I'll pronounce that one's a *Nest*;
 And *Fancy* says she knows some more,
 Yes, *Echo* answers, half a score.

B 2

2
12
5
Come,

Come, *Any* genius, then begin,
 And tell them all ere *Night* set in;
 But I am roving far at large,
 And quite forget *Diaria's* charge,
 To make our answers short and pat,
 And not *Dress'd* up with this and that;
 A long and tedious tale to tell,
 But all we answer, answer well:
 Then *Envy* not, nor think to blame,
 The man who hunteth after fame,
 In bringing forth to public view,
 From *Fire* and *Smoke*, with scarce a clue,
 Both *Candles*, *Mills*, and all the rest,
 The shortest way,—perhaps the best.

9. *On Spring; by Mr. Isaac Gumley, of Ansty, near Leicester.*

Once more we behold the sweet visage of spring,
 And winter is fled from our isle,
 The *Birds* round their new *Habitations* do sing,
 And *Fashion* appears with a smile.

The streams that so lately were fetter'd in ice,
 Now flow in meanders along;
 The hills and the valleys all seem to rejoice,
 And nature is big with a song.

Behold! how the lambkins now frolic around,
 The turtle-dove sweetly complains;
 Coy *Echo* repeats *Philomela's* soft sound,
 And *Night* is chear'd up with her strains.

To breathe the fresh *Air* by the side of the *Mill*,
 See *Colin* and *Phillida* rove,
 Or plac'd on the brow of a green sloping hill,
 Talk o'er the sweet pleasures of love.

While thus to each other such raptures they give,
 Pale *Envy* around them may hiss,
 Well *Marched* in wedlock, they'll happily live,
 Nor *Supplement* need to their bliss.

From the bustle of crowds, and the *Smoke* of the town,
 Ye lovers of wisdom retire;
 There, there all your *Dreams* of ambition lay down,
 And nature's productions admire.

The beauties of spring can more pleasures impart,
 Than *Candles* which glare at the ball;
 They never corrupt, or embarrass the heart,
 But lead to the Maker of all.

10. *A Sonnet, by Mr. William Evans.*

How gay were the scenes when I stray'd with my fair,
 While *Flora's* fair offspring perfum'd the *Air*;

From <i>Smoke</i> and from <i>clamour</i> how happily free,	9, 3
Nor <i>Envy</i> distressing or <i>Molly</i> or me.	7
The full-fledged <i>Nestling</i> was tuning her strain,	2
And harmony <i>echo'd</i> o'er valley and plain;	5
What nymph or what shepherd that roves o'er the lee,	6
So <i>Matchless</i> as <i>Molly</i> , or happy as <i>we</i> .	6
While <i>Fancy</i> still cheering each far distant day,	12
Lights <i>Hope's</i> friendly <i>Torch</i> to illumine life's way,	11
And morning and <i>Night</i> in sweet concord agree,	8
To add to the pleasures of <i>Molly</i> and me.	

11. *May Morning*; by Mr. W. Weatherill, of York.

The sun, glorious <i>torch</i> , that lights up the day,	11
Has chas'd the gloomy shades of <i>Night</i> away;	8
On ev'ry gay-drest mead and flowing stream,	1
His radiant beams diffuse a golden gleam;	
The <i>birds</i> high perched on each cloud-capt <i>tree</i> ,	2, 6
Make the groves <i>echo</i> with sweet melody.	5
As through the <i>Air</i> they dart from spray to spray,	4
Salute with blithest notes the new-born day.	
The gentle breeze that turns the <i>Mill</i> -sails round,	3
Raises the balmy odours from the ground;	
The sweetest fragrance that the flowrets wear,	
It sheds around, and sweetens all the air.	
Leave, leave the <i>smoky</i> town, ye <i>learned</i> train,	9, 10
Haste, hither haste, where health and pleasure reign;	
Drive from your <i>Fancy</i> , <i>Envy</i> far away,	12, 7
And here with me admire the rising day.	

12. *The ENIGMAS answered by Wildecotienfis.*

The sun was just peeping, the morning was fair;	
To the fields with my <i>Kitty</i> to take the fresh <i>Air</i>	4
I hasted, and as we walk'd gently along,	
The lark from his <i>Nest</i> cheer'd the skies with his song:	2
What a beautiful prospect extended around!	
There a <i>Corn-Mill's</i> rough music the cliffs did resound;	3, 5
There a clump of tall <i>Firs</i> at a distance was seen,	6
And the <i>Smoke</i> from the villages vary'd the scene.	9
Thus pleas'd with our ramble we carelessly stray'd	
Nor <i>Envy</i> nor <i>Fashion</i> once enter'd our head;	7, 1
But <i>Fancying</i> thus that too far we should roam,	12
We resolv'd to return, and so jaunted it home.	
There refreshed, we feasted our minds with chit-chat,	
Talk'd of <i>Lady Diaria</i> , her mate, and all that,	10
Read o'er the enigmas and queries till <i>Night</i> ,	8
Then found it was needful the <i>Candles</i> to light,	11

13. *The same, by Mr. William Bearcroft, of Nawton.*

Birdnest, echo, air, mill, fashion, and scandal,
Make half the enigmas if rightly they're guess'd;
Night, smoke, fancy, supplement, matches, and candle,
If I'm not mistaken, will answer the rest.

Many other solutions, with the names of all the other answerers, are inserted in the Supplement, pr. 6d. containing the same in quantity as the Diary, and accounts of eclipses, transits, and comets, &c. &c.

ANSWERS to the REBUSES and CHARADES.

Rebuses. 1 Cook, 2 Fox, 3 Wed, 4 Helen Latham, 5 Jane Gardener
Charades. 1 Eyeton, 2 Bridewell, 3 Lap-dog, 4 Breast-knot, 5 Starling, 6 Sunday.

1. *The Rebuses answered by Mr. Robert Allanson.*

If Cook or Fox do e'er design to wed,
And take a partner to the bridal bed;
There's none more worthy 'mong the British fair,
Than Helen Latham, or Jane Gardener.

2. *On Captain Cook, by Mr. William Boyer, of Leyland Free School.*

Rest, glorious Cook, beneath thy dewy shade,
Till death's destruction's universal made:
Jane Gardener, Miss Latham, Fox, and all,
In turn, will join thee at kind nature's call.

3. *The Wedding, by Mr. John Burrow, of Bolton Field.*

A dish to Cook, is my device	Breast knots on Sunday will appear;
'Gainst Fox and Clayton wed;	And Lap-dogs there you'll see.
Of starlings, woodcocks, all that's nice,	The parson the love knot will kneel
That can be caught or bred.	And have them safely ty'd,
For Latham and Jane Gardener,	And Clayton, tho' she be a wit,
Bride maids they say will be,	Will make a virtuous bride.

4. *The Rebuses answered by Mr. Philip Ruser.*

If Cook or Fox incline	Jane Gardener, good and kind,
To enter wedlock hands;	With Helen Latham, too,
At love and honour's shrine,	And ev'ry virtuous mind,
Present your willing hands.	The same design pursue.

5. *The Charades answered by Amaris.*

Should Eyeton chance to be a bride,	With breast-knot, or in palace due
Numbers would say 'tis well;	And Lap-dog by her plac'd;
Not yet, until the matter's try'd,	Yet who can penetrate the mind,
There's none can justly tell.	And view the secrets there?
Tho' starling's notes her voice excel,	Deliberation ere we're join'd,
On Sunday she be grac'd	Then ought to be our care,

6. *The Wifh*; answering the *Cbarades*, by I. E. Strephon.

Let the Belles with fine *Breast-knots* go flaunt it along,
 Attended with *Lap-dog*, with flattery and throng,
 Be it mine with some fair such as *Eyeton* to prove
 The sweet satisfaction of conjugal love:
 And fearless of *Bridewell*, we'll jocundly stray,
 Where the thrush and the *fiarling* enliven each spray;
 And by virtue attracted to church still repair,
 Each *Sunday* to join with the pious in prayer.

7. *The same*, by Philomath, of Rotheram.

To you, ye lovely fair, these hints I send;
 Accept this admonition from a friend.
 Revere the *Sabbath*, holy keep the day,
 And to your great Creator rev'rence pay:
 Let no false swain in courtship e'er deceive
 With *Breast-knots*, nor his flatt'ring words believe:
 Though fair as *Eyeton*, you may, when too late,
 Repent in *Bridewell* your too cruel fate.
 Then as the *fiarling* chants her rural lays,
 So may you ever sing your Maker's praise.

ANSWERS to the QUERIES.

QUERY I. answered by Mr. Thomas Eland.

The busy world, all day in arms,
 With sounds confus'd our ear alarms,
 Till nought distinct we hear:
 At night, the busy world laid 'by,
 The unmix'd sound will swiftly fly,
 And sweetly kiss the ear.

The same, by Mr. John Dalton, of Kendal.

In the night time, when the air is calm and nature is composed, sounds are fewer, and heard more distinctly, than in the day, when the air is frequently more agitated by winds, and a greater variety of sounds prevails, which prevent the mind from making so accurate a discrimination of them, as in the other case. Add to this, that probably the mind may be more attentive than ordinary to ideas of sound at that time, when the faculty of vision is in a great measure suspended for want of light.

QUERY 2. answered by Mr. James Williams, of Colyton.

The sound is caused by the small bubbles which are continually rising from the bottom; and it is more distinctly heard in the tea-kettle, than in any other vessel, on account of its globular form: while the bubbles ascend singly, the steady sound continues; but when the water becomes so hot, that several unite together, and ascend as it were in flakes, ebullition commences. There have been various opinions concerning these bubbles: Professor Hamilton, in his ingenious theory of vapours, *Philos. Transf.* vol. 55, endeavours to prove, that they are formed by elastic steam: and it is well

known, that when the steam is let out of the boiler of a steam engine, into the open air, it causes a very loud roaring noise.

The same, by Mr. I. Crosbey, at Peasehault Green, Yorkshire.

The sibilation or singing of the tea-kettle, is caused by the bubbles of air, being driven through the water (with a rapid motion) by the particles of fire, and dashing the said water against the hot concave sides of the vessel, and so causing the noise,

QUERY 3. answered by W. H. Hall, Esq. Barrister at Law.

In some cases were divorces more easily obtained, it would tend to be serviceable to the state:—but, in other cases, a scandalous abuse of the rights of marriage.—I apprehend, the only answer that can be given with propriety to this query, is founded on two non-existing principles in the doctrine of civil society, namely, 1. An exemplary punishment annexed to the proofs in the first instance.—2. A prohibition of instituting suits in ecclesiastical courts unless warranted by real proofs.—Were these considerations attended to, divorces would no doubt be salutary to the health of the nation; but, until those regulations take place, the methods of obtaining those dispensations are liable to the grossest abuse; for a virtuous wife may be brought under the denomination of a harlot, if her husband be base enough to prefer a suit against her, as the present state of the laws of divorce abounds in errors.

The same, by Mr. John Dalton.

It seems unlikely that the marriage state would be rendered happier, were divorces much more easily to be obtained: For, the condition of the female sex in general would evidently be greatly depressed by it, without any equivalent advantage to the other sex; as is the case in most uncivilized countries, where haughty tyranny, united with abject submission, affords few instances of that conjugal felicity, which is only to be obtained from mutual love and esteem. In short, any thing that has a tendency to lessen the dignity of the fair sex, in my opinion, is unlikely to encrease the happiness of the marriage state.

The same, by Mr. Alexander Rowe.

It is a general maxim, that when any thing can be easily obtained, the thing itself will be but little desired. Therefore make the obtaining of divorces easy, and they will rarely be regarded or attended to, and consequently it would contribute to the happiness of the married state.

QUERY 4. answered by Mr. James Williams.

Mr. Ray, in his 'Wisdom of God in the Creation,' has these words: 'Those animals, when young and little, finding in the stone some small hole reaching to the middle of it, might, as their nature is, creep into it as a fit *latibulum* for the winter, and grow there too big to return back by the passage by which they entered; and so continue imprisoned therein for many years; a little air, by reason of the coldness of the creature, and its lying torpid there, sufficing it for respiration, and the humour of the stone, by reason it lay immoveable and spent not, for nourishment.' This seems to be possible, and is the best solution I know of.

The same, by Mr. J. Walton, of Allen Town.

As there are no proofs of a spontaneous generation of animals, we may conclude, that either the young toad or the semen must have fallen through the crevices of the stone or rock, into the place where it is found; and so have continued there so long that the crevices have nearly closed upon it, by reason of the growing quality of the stone. And as the dormouse and several other animals, are in a torpid state all the winter; so the toad might continue in that inactive state, requiring no food during that interval, more than those other animals.

QUERY 5, answered by Mr. John Dalton.

The temperature of the air, in clear, serene weather, as determined by the thermometer, is generally as follows: The greatest cold in the 24 hours, prevails at, or a little before sun rise; from thence till about two afternoon, the heat gradually increases, and afterwards gradually decreases till next morning: Which may be accounted for thus: The clear air affording a free passage for the sun's rays, like other transparent bodies, receives very little heat from them; of course then its heat must be chiefly derived from the surface of the earth, which being acted on by the sun's rays, will constantly communicate its heat to the adjacent air; so that as the surface gradually increases in heat from sun-rise till sometime afternoon, and then decreases in the same manner; so will the air also that is near it.

If the ingenious querist have frequently found it colder about sun-set than afterwards, he must have judged of the temperature from sensation, and not from a thermometer.

QUERY 6, answered by Mr. Wm. Bearcroft.

I think it may be said, without incurring the imputation of atheism, that no system of philosophy gives us either convincing or demonstrative proofs of the immortality of man. Perhaps metaphysics bids fairest to answer the conditions of the query.—Inferences may be drawn from anatomy, and even from botany; but every argument drawn from philosophy seems to be weak; and it is from inspiration only that we have convincing proofs of the immortality of man.

See the Supplement for many other answers to the Rebuses, Queries, &c. and the list of acknowledgments, which there is not room for here.

NEW ENIGMAS.

I. ENIGMA 709, by Eugenio.

My parts, ye fair, divided lay,
Far from the genial warmth of day,
In colour diff'ring, and in name—
These, man combin'd, and rais'd to
fame.
Now oft in station high I'm found
With gay companions rang'd around,
When (how unlike the sons of pride!)
Our letter o'er the great preside,
Who, guided by their pigmy king,
Obedient mount aloft and sing.
But when (as sometimes is the case)
In rural sports we find a place,

There none pre-eminence can boast;
And ah! our lofty station's lost.
Yet ev'ry nymph, and ev'ry swain,
Hears with delight our artless strain.
When the gay sons of Bacchus join
To pour libations at his shrine,
Oft to my friendly aid they fly,
Their wild excesses to supply.
Yet I (tho' strange it may appear)
With serious warnings strike their ear,
And shew—but that I must conceal,
Lest I destroy Enigma's veil.

II. ENIGMA

II. ENIGMA 710, by Mr. George Beck.

Stand forth ye daring sons of art,
 And take a brother-brush's part;
 Who on Parnassus ne'er refuses,
 To form a mansion for the muses:
 For on that hallow'd hill I dwell,
 And visit ev'ry gloomy cell.—
 Swift when th' impetuous god inspires,
 My fingers sweep the trembling wires;
 And at the nod of mortal men,
 I guide, or seem to guide the pen.
 My feet, more flimsy than a spider's,
 Oft bear a horse and two fat riders:
 Yea old and young, and belles and
 beaux,
 Heedless tread my tender toes.—
 I oftimes by the moon's pale lamp,
 O'er the meads and marshes damp,
 Or on the glittering streamlets wander,
 And seem a grey goose, or a gander;

Or, furious like a spectre grim,
 O'er the raging ocean skim,
 Untill I sweep some rampart high,
 And rear my head into the sky.—
 Of yore, in dread tremendous state,
 I in the very centre sate
 Of wild confusion's blank domain,
 And held an unmolested reign;
 Until some mighty voice that spake
 Bid ev'ry nerve of chaos break;
 Bid jarring atoms cease their strife,
 And worlds unnumber'd launch to
 life:
 'Twas then I took my instant birth,
 And fell down flat upon the earth.
 In this new state, ev'n whilst a miscreant
 I was a rapid bold designer,
 Who, in the twinkling of an eye,
 Ap'd ev'ry soul that durst stand by,

III. ENIGMA 711, by Drytoast,

Pretty masters and misses, your servant is come,
 To dance you a jig to the tap of the drum;
 To the tap of the drum, or the harp's softer twang,
 To divert and amuse you I'll do all I can:
 Like an Andrew or Harlequin tumble and jump
 With ease o'er your heads, and pitch on my rump;
 Now balance in air, now fall, and now rise,
 With a hundred such frolicks, that please and surprize;
 From the East to the West, and back again bound,
 And sailor-like box you the compass all round.
 With thump upon thump, and stroke upon stroke,
 The patience of Job quite enough to provoke;
 Yet for all this rough treatment I never will tire,
 While the music is playing, tho' I've nought for my hire,
 When the drum or the harp their music give o'er,
 As a stone or a block I lie on the floor;
 Al'ho' I'm so active and frisk it about,
 And foot it, and turn it, and make such a rout.—
 In form I'm a monster; no head, leg, or arm;
 From four to twelve wings, to secure me from harm;
 With a body, dear misses, in shape like a thimble,
 That hops, skips, and jumps, and makes me so nimble.
 For my wings, to the birds indebted I stand;
 For my body, to trees brought from some foreign land;
 And whenever my maker wou'd have me look smirken,
 A skin of some beast is my waistcoat or jerken;

Tho' most times I'm naked, and jig it in buff—
But hold, pretty masters, I've sure said enough
Of my person, and anticks—and now tell me whether
I'm as heavy as lead, or as light as a feather.

IV. ENIGMA 712, by Kit Went.

In *Spring*, dear ladies, I keep company
With that sweet nymph, yclept Euphrosyne;
Nay, am in favour with the Graces three.
With fair *Urania* I'm a welcome guest,
In rapture she will press me to her breast,
While in her arms inclos'd I sink to rest.
In *Summer*, with fair *Flora* I am seen,
In dress resplendent, cloath'd in liv'ry green;
For in her service I have ever been:
On her attend in each sequester'd grove,
Where feather'd songsters warble forth their love,
Frequent with her in sweet retirement rove.

When sweet *Pomona*, flush'd with *Flora's* reign,
Descending, deigns to bless the fruitful plain,
The goddess marks me second in her train.
'Tis then in orchards, I with freedom stray,
Through groves of fruit-trees elegantly gay;
And thus, in pleasure's round, I pass the day.

But where stern *Winter* reigns,—oh horrid sound!
Plac'd in a circle, to its centre bound,
In dire despair, I'm fixed in the ground:
Thus to my prison dragged like a slave,
Void of all pleasing hopes, no one to save,
In silent tears at last drop in the grave.

Now ladies fair, should you unfold my name,
You cannot possibly raise me to fame,
Tho' to a crown I justly lay my claim;
First in, what's term'd rebellion, do appear,
With armed troops, with target, sword and spear,
Yet from all bloodshed, guilt, and blame am clear.

V. ENIGMA 713, by Quis.

I great assistance give to all mankind;
Search thro' these lines, and you my name may find.
A friend I have of constant use to me;
But I the active am, the passive he.
Alone, our talents cannot be display'd;
Without the other, each is useless made —
Now, in the maze I wander too and fro;
And act by contraries where'er I go;
And, like the wife of old *Laertes* son,
Now act, now counteract the work I've done.

I can

I can unravel mysteries; and with care
 Things in obscurity, make plain appear.
 Without my special aid you try in vain,
 The rebus or enigma to explain.—
 Now I have surely said enough to tell
 What, tho' a while conceal'd, you know so well.

VI. ENIGMA 714, *by Miss Louisa Harper.*

In me a fav'rite guardian you behold,
 Priz'd as protector both of young and old.
 Two mighty powers I oftentimes defy,
 If summer glows, or winter storms are nigh.
 When eastern kings appear in splendid state,
 Amidst their train I wear a look elate;
 To guard the monarch from a foe I dare,
 And brave his fury with undaunted air.
 But this great service o'er, my pride is fled,
 I'm thrown aside—abash'd I droop'd my head.
 In Albion's isle, scarce forty years ago,
 I ne'er appear'd, but in some dismal show;
 In gloomy church-yards, then with clumsy mien,
 To wait on priests throughout the fun'ral scene;
 Whilst beating rain and blust'ring wind wou'd tear
 Ev'n the rough habit my poor frame did wear.
 But now each rank, each sex, do greatly me care;
 And most weeks seen in various sorts of dress.
 Not spring's fair meads more lively tints display,
 Than those my spreading crest full oft array.—
 Ladies, my name I'm sure you'll now declare,
 To shield your beauty is my frequent care.

VII. ENIGMA 715, *by Mr. Wm. Francis, Master of Hook Academy.*

Tho' a rogue we oft hide, a frail nymph oft conceal,
 Too hastily do not abuse us:
 The honest and brave may the want of us feel,
 Nor their hands will chaste virgins refuse us.
 When far from his station the sentinel's found,
 If he's ty'd up and flogg'd, 'tis not odd;
 Tho' we move not two yards from our posts, we are bound,
 And we cannot escape from the rod.
 Each single remains, yet our rings we all wear,
 Those ensigns of females who wed.
 No offspring we have, yet believe me, ye fair,
 We are all in our turns brought to bed.
 Kings, lords, and plebeans, with warmth we protect:
 Good actions too oft, are forgot!
 Our services surely you'll think they neglect,
 To be hung, drawn, and quarter'd's our lot.

VIII. ENIGMA

VIII. ENIGMA 716, *by Miss Betty Smales*

In gay appearance I am always seen;
 With humming insects skim the verdant green;
 With bird and beast I'm found, with man and woman;
 And help to save when danger comes upon 'em.
 I of this earth compose the greatest part,
 And stand display'd the centre of the heart.
 For me, the warblers swell their downy throats;
 For me, soft music pours her dulcet notes;
 With fond delight I meet the voice of love,
 And aid young Damon's whispers in the grove.

IX. ENIGMA 717, *by Mr. T. E. Leicester*

In Eden's garden first my birth I date,
 And was 'fore Adam and his loving mate,
 In those blissful realms where aromatic flowers
 Diffuse their sweets, enlivening myrtle bowers.
 Where innocence decreed to raise her throne,
 In vest transparent as the starry zone.
 With them I shar'd the great indulgence giv'n,
 With them the wrath of injur'd angry heav'n,
 When they with dire transgressions disobey'd
 Th' Almighty's word, and forfeited his aid:
 Then I with them was banish'd paradise,
 Expel'd by justice, wisdom's scourge for vice.
 How hard my lot, when through me they had breath,
 That in return with them I suffer death.
 Yet I the fallen race do still attend,
 To be to them both ornament and friend.—
 The shepherd swain, who hastes to yonder grove,
 His bosom fir'd with warmest thoughts of love,
 To meet his nymph while zephyrs wave each spray,
 I am his guide, and foremost lead the way;
 And when with joy he gives the rapturous kiss,
 I'm near, to share the sweet extatic bliss.—
 But hark! methinks I hear the neighing steed,
 Nor hedge or ditch the hunter can impede;
 The timid hare; she leads the merry dance,
 And led by me the full-mouth'd hounds advance;
 Still pressing close, at length she yields her breath,
 Whilst huntsman's hollow hails the victim's death.

X. ENIGMA 718, *by Mr. S. Oxley, of Wolsingham, Durham.*

Dear ladies your servant, most humble and servent,
 To Diary presents his petition;
 A brief candidate, with tale to relate,
 And hopes you will grant him admission.
 I'm employ'd when you dress, and you ost me cares,
 And secrets unto me discover,

Great favours I share, beyond all compare,
Such as oft are deny'd to your lover.

I'm as gallant in shew as a sprightly young beau,
For I'm drest as suits best with your fancy ;
I'm green and I'm blue, and of every hue ;
Yet scarlet best pleases young Nancy.

I'm round, and I'm square, and am quite debonair ;
Yet remorseless you are, if not stupid ;
For many a keen dart you plunge in my heart,
Such as never were sent you from Cupid.

XI. ENIGMA 719, by Mr. Wm. Jones.

No more, ye fair, rely on * Warren's art,
To polish youth, and charms to age impart ;
His boasted efforts in the end will prove
The bane of beauty, and the foe of love.
Be mine the task to make Britannia's fair
Unrival'd shine, and envy'd favours wear. —
Joy is my parent, and from pleasure's source,
I heighten beauty, and improve its force ;
By art engaging make the homely please,
And love's soft fetters ever forge with ease.
Man's gen'ral father felt my subtle pow'r,
When Eve with me first grac'd the nuptial bow'r. —
The gallant Norngfuk ev'ry art essay'd,
In hopes to gain me from a Greenland maid,
But Ajat, frigid as her native zone,
Reserv'd the boon for Anningait alone. —
When Celia's Pompey fought the gloomy shade,
Where pallid ghosts in sullen pomp parade,
For three whole days the nymph no comfort knew,
For three whole days I ne'er appear'd in view ;
Lo ! on the fourth the gay Myrtillo came,
With love's artillery, and attack'd the dame ;
The soften'd maid to soothe his am'rous pain,
From exile call'd me to his aid again ;
I quick appear'd, and to the swain was giv'n,
A pleasing earnest of his future heav'n.

* Perfumer.

XII. Or PRIZE ENIGMA, 720, by Mr. Henry Lee. — (*Whoever answers it before Candlemas Day has a chance for 8 Diaries, and another for 8 also.*)

Yes, let the tempests rise, let lightnings play,
And mighty darkness shade the face of day ;
Let sevenfold thunders from Olympus fall,
And to the centre shake the solid ball ;
This nought avails ; I can the shock sustain ;
Tho' ever changing, yet am still the same. —
Most objects seem the greatest when they're near,
But farther off, the greater I appear :

Survey'd

Survey'd in front, gigantic limbs arise,
 But back-views dwindle into pygmy size.
 One thing is odd;—dislik'd, I longest stay;
 When most belov'd, I seem to fly away.
 I'm hard or easy, just as people make me,
 And long or short, according as they take me.—
 On level plains, in fertile countries found,
 (Where science flourishes, and arts abound)
 With firs close-joining mostly fenc'd around;
 Here midst a group, or single, oft I stand,
 With a fell weapon poiz'd at my command:
 Astonish'd youth survey my form awhile,
 Admit the thoughts of death, and back recoil.
 Just so accoutred stands the simple swain,
 Equip'd for slaughter on th' autumnal plain;
 The village striplings on him cast their eye,
 And think the time of harvest-home is nigh.—
 When dying libertines meet fate's decree,
 Their last, their latest wish, is oft for me.
 The atheist too, at death's approach, declares,
 Possess'd of me, alas!—he'd say his pray'rs.—
 When civil troils have level'd hallow'd fanes,
 And cities sunk beneath devouring flames;
 In me behold the mighty fabrics rise,
 Again the temples kiss their kindred skies!

}

*We have been under the necessity, with the greatest reluctance, to curtail
 part of these Enigmas, for want of room, rather than omit them intirely.*

NEW REBUSES and QUERIES.

I. REBUS, by Mr. Rob. Richardson.

The heads of two shadows, in order I place,
 And fix myself aptly between;
 When, my wishes to crown, and my labours to grace,
 A lovely Diarian is seen.
 But, beware, ye rash youths, who address the coy fair,
 Fondly hoping her credence to gain;
 Unheeded ye sing of your sorrow and care;
 The fugitive laughs at your pain.

*We are sorry that the last letter of this very learned and ingenious correspon-
 dent, was delayed at the office, and arrived too late to insert the new Enigma
 this year. We approve of most of his ideas about our new Supplement to the
 Diary, (a work so universally desired by our correspondents, and improving
 and extending the Diary itself,) and he will perceive that we had adopted
 several of them before his letter arrived, particularly by enlarging it to the size
 of the Diary with part of the mathematics, &c.*

II. REBUS, by Mr. Wm. Hart.

What gen'rous Britons more than life esteem;
 A judge in Pluto's realm, as poets dream;
 Th' unhappy nymph who for Narcissus pin'd;
 The place for the departed just assign'd;

And

And she who o'er the lib'ral arts presides;
 She who th' unerring scales of justice guides;
 And he whose trident rules the foaming sea:
 Th' initials join'd, a fair one's name you'll see,
 In whom is elegance of form combin'd,
 With ev'ry grace that beautifies the mind.

III. REBUS, by I. E. Strephon.

To three fifths of a joint, add a father's delight,
 (But be careful to cull the odd pieces aright)
 And you'll see such a nymph as is rare to be found,
 For wit and good-nature so justly renown'd.

IV. REBUS, by Mr. J. Singleton.

To two thirds of a month, and two-thirds of a grain,
 Add five-fifths of a bard, who much honour did gain:
 When these parts you've together in order combin'd,
 Then the name of a fair one you quickly will find;
 Who with beauty's so blest, and whose wit is so fine,
 That she always appears as if something divine.

V. REBUS, by Mr. T. King.

Take four initials from the winds,	Then in an instant you will find
And them in order place;	What oft we glad embrace.

I. QUERY, by Mr. Henry Lee.

Is it possible for two persons, of opposite sexes, to hold a strict friendship with each other, without some degree of love?—Provided that such a friendship does exist, (allowing a little love to be at the bottom of it) and circumstances so embarrassing as to render an union of the parties highly improper; how far ought this friendship to be cherished after the marriage of one of them is consummated?

II. QUERY, by Mr. Isaac Gumley.

It has long been observed that when the sky is red in the evening, it will be fair weather; and when red in the morning, the contrary; which seems also to be corroborated by our Saviour, in Matthew xvi. chap. ver. 2 and 3. I shall be glad to know from some of the Diarian Correspondents, what natural reasons can be assigned for the same.

III. QUERY, by Christianus.

The best method of preserving eggs, is perhaps by varnishing them. I have seen an egg broken that had been varnish'd 12 months, and it was found as if it had been new laid. What reason can be assign'd for this?

IV. QUERY, by Mr. James Spilling.

What cause can be assigned for the sun not appearing so large when in the horizon in the evening, as he does in the horizon in the morning?

V. QUERY, by Mr. John Cairns.

When a person happens to see or hear another person yawn, he is forcibly urged to do the same. What may be the reason of this?

VI. QUERY, by Mr. T. Cock.

Whether is the double or single microscope the most proper for the examinations of very minute objects.

* * * The number of Prizes, and other remarks, are as usual.

ANSWERS to the MATHEMATICAL QUESTIONS.

I QUESTION 878 answered by Mr Geo. Beswick.

IN the given equation $2x^3 - x^4 - x^2 + 2x^2y - y^2 = 2xy$, transpose all the terms to one side, and its square root will be $x^2 - x - y = 0$, or $x^2 - x = y$; by which divide the equation $\sqrt{x^5y} - \sqrt{x^3y} = 2xy$, or $x^2 - x \times \sqrt{xy} = 2xy$, and the quotients give $\sqrt{xy} = 2x$, or $y = 4x$; therefore the two values of y , viz. $x^2 - x = 4x$; hence $x - 1 = 4$, or $x = 5$; and consequently y or $4x = 20$. Therefore the ages are 25 and 20 years.

The same by Mr Geo. Stevenson.

The third quantity transposed to the same side with the first, gives $x^2 - x - 2y \times x^2 - x + y^2 = 0$, which is evidently a square, and its root is $x^2 - x - y$, therefore $x - 1 \cdot x = y$. And the latter of the given equations gives $x - 1 \times \sqrt{xy} = 2y$; this squared, and divided by y , gives $x - 1 \cdot x = 4y$; therefore by substitution $x - 1 \cdot x = x - 1 \cdot 4x$; hence $x - 1 = 4$; and $x = 5$. And the ages 20 and 25.

The same by Mr. John Craggs, of Hylton.

By transposing the 3d quantity, and extracting the root, it is $y = x^2 - x$. The second given equation squared, and divided by xy , gives $x^4 - 2x^3 + x^2 = 4xy$; which added to the 1st and 3d quantities, gives $y = 2x^2 - 6x$. Consequently $2x^2 - 6x = x^2 - x$; hence $2x - 6 = x - 1$, or $x = 5$; and therefore $y = 20$. And the ages 20 and 25.

See other answers to this and the other questions, and the acknowledgments, in the Supplement.

II QUESTION 879 ans. by Mr Matt. Fleck, of Stella.

Put $x =$ the length, and y the breadth of the rectangular field; then is xy its area. Hence, by the question

$$x + 5 \times y + 2 \text{ or } xy + 2x + 5y + 10 = xy + 430, \text{ and}$$

$$x + 2 \times y + 5 \text{ or } xy + 5x + 2y + 10 = xy + 445.$$

$$\text{Or } 2x + 5y = 420, \quad \left. \begin{array}{l} \text{The dif. of these is } 3x - 3y = 15, \\ \text{and } 5x + 2y = 435. \end{array} \right\} \text{ or } x - y = 5, \text{ and } x = y + 5.$$

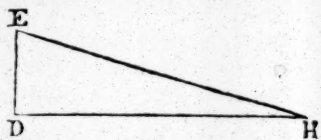
This value taken for x in the equ. $2x + 5y = 420$, gives $7y + 25 = 435$; and $y = 58\frac{2}{7}$; hence $x = 63\frac{4}{7}$.

The same by Mr Henry Tilney, junior.

Let x and y be put for the length and breadth of the rectangle. Then per quest. $x + 5 \times y + 2 = xy + 430$, and $x + 2 \times y + 5 = xy + 445$. By comparing these two together, it appears that $x = y + 5$. Hence by substituting this value of x in the first equation, and reducing it we have $y = 58\frac{2}{7}$. Whence $x = 63\frac{4}{7}$ poles.

III QUESTION 880 answered by *Amicus*.

In the right-angled spherical triangle E
 EDH , DH is an arch of the equinoctial,
 measuring the hour from 6 when the sun
 is due east at E ; EH the altitude, DE
 the declination, and DHE the latitude 22° .



By Crackelt's translation of Mauduit's Trigon. page 68, prob. 3. as
 $\cot. 11^\circ : \tan. 11^\circ :: s. EH + DH : s. EH - DH$, therefore the sines
 of the sum and dif. of EH and DH are in a given ratio; conseq. the
 greater the sine of the sum, the greater that of the dif. and of necessity
 the greater must the dif. itself be: but when the sum is a quadrant,
 its sine is the greatest possible; and therefore as $\cot. 11^\circ : \tan. 11^\circ$
 $:: s. 90^\circ : s. EH - DH$ when a max. $= 2^\circ 10'$ *fere*. Hence $DH =$
 $43^\circ 55'$, $EH = 46^\circ 5'$, and $DE = 15^\circ 39'$ north declin. May 2 at
 $55'$ past 8 *A. M.*

The same by Mr David Kinnebrook, junior.

Let E be the sun's place at the time of observation, EH his altitude,
 DH part of the equator, DE the declin. then is the $\angle H = 22^\circ$ the
 latitude of the place, whose cosine let $= c$, also the $\tan. EH = x$;
 then per spherics, $1 : c :: x : cx$ the $\tan.$ of DH , whence the fluxion of
 the arc DH is $\frac{c\dot{x}}{1 + c^2x^2}$, and that of the arc EH is $\frac{\dot{x}}{1 + x^2}$; but the dif.
 of the said two arcs is, by the question, a maximum, consequently
 $\frac{\dot{x}}{1 + x^2} - \frac{c\dot{x}}{1 + c^2x^2} = 0$; hence $x = \sqrt{\frac{1}{c}}$ the tangent of $EH =$
 $46^\circ 4' 58''$ the sun's altitude; and $cx = \sqrt{c}$ the $\tan.$ of $DH =$
 $43^\circ 55' 2''$ the measure of the hour from 6; from whence by spherics
 the declination is found to be $15^\circ 39' 18''$, answering to May 2d, 8 h
 $55m 40s$ in the morning.

The same by Mr Wm. Simpson, junior.

Let E be the sun when due east, $\angle H$ the latitude, DE the sun's
 declination, and DH the time from 6. By tab. 1 pa. 280 Simpson's
 $\text{Flux. } EH : DH :: \cos. DE : \sin. \angle E$. But when $EH - DH$ is a max.
 then $EH = DH$; conseq. $\sin. \angle E = \cos. DE$. By spherics, radius
 $: \cos. DE :: s. \angle E = \cos. DE : \cos. \angle H$, or radius $\times \cos. \angle H =$
 $\cos.^2 DE$. Theref. when $\text{rad.} = 1$, $\cos. DE = \sqrt{\cos. H} = .9629040$
 the $\cos.$ of $15^\circ 39' 18''$ the sun's declin. answering to May 2. Also
 radius : $\cot. \angle H :: \tan. DE : \sin. DH = 43^\circ 55' 2''$. Hence the
 observation was made at 8 h $55m 4'' 8'''$.

IV QUESTION 881 answered by *Mr Alex. Rowe,*
of Reginnis.

The probability that 3 heads precisely out of 9 halfpence at one
 throw, or, which is the same, that one halfpenny comes up a head

precisely 3 times in 9 throws, by prob. 5, Simpson's Laws of Chance, is $\frac{9 \cdot 4 \cdot 7}{3 \cdot 2^9} = \frac{21}{128}$, and therefore that of the contrary is $\frac{107}{128}$. And, by the same problem, the probability that it happens just 4 times in 5 trials, is $5 \cdot \frac{4}{2} \cdot \frac{3}{3} \cdot \frac{2}{4} \cdot \frac{107 \cdot 21^4}{128^5} = \frac{104047335}{34359738368}$. So that the odds are as 34255691033 to 104047335, or nearly as 329 guineas and $\frac{1}{4}$ to one.

The same by Mr James Ashton, of Harrington.

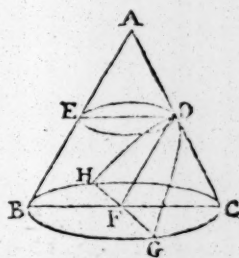
The 9th power of 2, or $2^9 = 512$ are all the chances; and it appears by the binomial theo. that there are $\frac{84}{512}$ and $\frac{428}{512}$, or $\frac{21}{128}$ and $\frac{107}{128}$ chances respectively for and against 3 heads precisely at one throw. Put $a = 21$, $b = 107$, $n = 5$, and $t = 4$; then, in the series $a^5 + 5a^4b$, &c. $5a^4b$ is the term in which the index of a is t ; therefore $\frac{5a^4b}{a+b} = \frac{104047335}{34359738368}$ is the probability of happening precisely 4 times in 5 throws. Therefore the odds against the gamester are 34255691033 to 104047335, or 329 guin. 4s. 10d. to 1 guinea.

V. QUESTION 882 answered by Mr John Dalton.

The lengths of pendulums are as the forces of gravity, and the squares of the times of their vibration. If, therefore, the times be constant, the lengths will be simply as the forces. And as gravity decreases in the inverse ratio of the square of the distances from the earth's center; therefore its force at the distance of 4 radii, will be $\frac{1}{16}$ of that at the surface, and consequently the length of the pendulum $\frac{1}{16}$ of its length at the surface $= \frac{1}{16}$ of $39 \frac{1}{8} = 2.445$ inches, or $2 \frac{4}{9}$ nearly.

VI QUESTION 883 ansf. by Mr Geo. Brown, of Newcastle.

Let ABC be the cone, DE the diameter of the circular section, parallel to BC, and DFG half the parabolic section parallel to the side AB. Now BC being 8, and the perp. altitude 10, therefore AB^2 or AC^2 is $= 116$. By the nature of the circle, $\sqrt{BF \cdot FC} = FG$ half the base of the parabola; and, by sim. tri. $BC : BA :: FC : FD = \frac{FC \cdot AB}{BC}$ its altitude;



theref. $\frac{4}{3} FG \cdot FD$ or $\frac{4}{3} \sqrt{BF \cdot FC} \cdot \frac{FC \cdot AB}{BC}$ is the area of the pa-

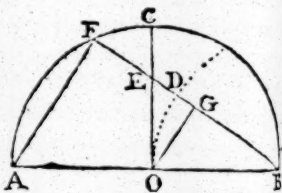
rabolic section. And $p \cdot DE^2$ or $p \cdot BF^2$ is the area of the circular section, where $p = .7854$. Theref. by the quest. $\frac{4}{3} \sqrt{BF \cdot FC} \cdot \frac{FC \cdot AB}{BC}$
 $= p \cdot BF^2$. Hence by squaring, &c. it is $16 AB^2 \cdot FC^3 = 9 p^2 \cdot BC^2$
 BF^3 , or $BF^3 : FC^3 :: 4 AB^2 : p \cdot 3 BC$; and hence $BF : FC$ or $AD : DC$
 $:: \sqrt[3]{16 AB^2} : \sqrt[3]{p^2 \cdot 9 BC^2} :: \sqrt[3]{29} : \sqrt[3]{9 p^2} :: 1.7351 : 1$. Hence then
 $BF = 5.075$; and $FC = 2.925$.

The same answered by Mr Joseph Peace.

Put $p =$ the perpendicular, $b =$ the base BC , $s = AB$ the slant side of the cone, $a = .7854$, and $x = DE$ or BF the diameter of the circular section. Then $2 \sqrt{BF \cdot FC} = 2 \sqrt{b - x \cdot x} = GH$ the base of the parabola; and by simple triangles $b : s :: b - x : \frac{b - x}{b} \cdot s = DF$ its alt. Theref. by the quest. $2 \sqrt{b - x \cdot x} \times \frac{b - x}{b} \cdot \frac{2}{3} s = ax^2$. Hence by reduction is found $x = \frac{b}{1 + \sqrt[3]{\frac{9a^2b^2}{16s^2}}} = 5.075$ nearly.

VII QUESTION 884 answered by Mr John Cullyer, of Hingham.

Let the figure be drawn as per question, and join AF . Assume the radius BO or $BD = 1$, and put $x =$ sine of $\angle BEO$ or BAF ; then is $EF = 2x$, and as $x : 1 :: BO$ or $1 : \frac{1}{x} = BE$. Hence $EF = 2x - \frac{1}{x}$, A



and $ED = \frac{1}{x} - 1$; and consequently $EF \cdot ED$ or $2x - \frac{1}{x} \times \frac{1}{x} - 1$ must be a max. This being put into fluxions, and reduced, there arises this cubic equation $x^3 + \frac{1}{2}x = 1$, the root of which is $x = .835122$, the sine of $56^\circ 38'$ the $\angle BEO$ or BAF ; and therefore $BE = BO \cdot .835122 = .835122$.

The same by Mr Abel Whitehouse.

Put $BE = x$, and rad. BO or $BD = 1$. Then $BE : BO :: BA : BF$, that is $x : 1 :: 2 : \frac{2}{x} = BF$. Hence $EF = \frac{2}{x} - x = \frac{2 - x^2}{x}$, and ED

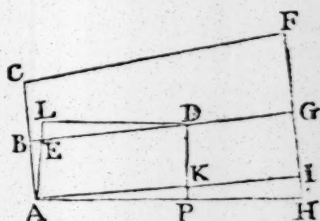
$=x-1$. Therefore $EF \cdot ED$ or $\frac{2-x^2}{x} \times x-1$ is a max. The fluxion of which made $=0$, and the equation reduced, we get $x^3 - \frac{1}{4}x^2 = 1$; the root of which is $x = 1.197$ nearly.

The same by Mr John Boden, of Cromford.

Draw the chord AF , which will be perpendicular to BF ; and let the radius AO or $OB = 1$, and $DE = x$. Then, by similar triangles, $FE:BO::BA:BF = \frac{2}{1+x}$; hence $EF = BF - BE = \frac{2}{1+x} - 1 - x$; and consequently $DE \cdot EF = \frac{2x}{1+x} - x - x^2$ is a maximum; the fluxion of which made $=0$, and reduced, gives $2x^3 + 5x^2 + 4x = 1$; the root of which is $x = .1974$. Hence $EF = .47312$, and $DE \cdot EF = .093346$, as required.

VIII QUESTION 885 *anf. by Mr Da. Kinnebrook, jun.*

Let BG be the axis of the frustum, and $ACFH$ a section of it through the middle of two of the opposite hexagonal sides, which section it is evident must be perp. to the horizon. Now the sides of the hexagon at each end being 6 and 9, AB and GH , perpendiculars from the centre to the middle of the sides, are easily found to be $3\sqrt{3}$ and $\frac{9}{2}\sqrt{3}$ respectively. Draw AI parallel to BG , also PD and AE perp. to AH ; then if the frustum rest in equilibrio on the point P , it is requisite that AH should be parallel to the horizon, and that the centre of gravity of the frustum be at the point D where the line PD meets the axis BG . Put $AB = 3\sqrt{3} = a$, $GH = \frac{9}{2}\sqrt{3} = b$, $HI = \frac{3}{2}\sqrt{3} = c$, $AP = 12 = d$, and $AH = x$. Then, by sim. trian. $AI:AH::AP:AK$, that is $\sqrt{x^2 - c^2}:x::d:\frac{dx}{\sqrt{x^2 - c^2}}$ $= AK = ED$; again $AI:IH::AB:BE$, that is $\sqrt{x^2 - c^2}:c::a:\frac{ac}{\sqrt{x^2 - c^2}}$ $= BE$; then $BE + ED = \frac{ac + dx}{\sqrt{x^2 - c^2}} = BD$; but BD is also $= \frac{1}{2}\sqrt{x^2 - c^2} \times \frac{3b^2 + 2ab + a^2}{b^2 + ab + a^2}$ by the method for finding the centre of gravity, (see page 74, *Dr. Hutton's Mathematical MN-



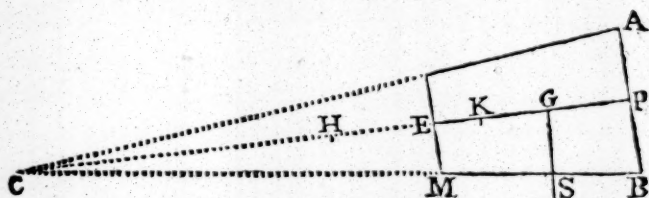
* There is just published a new edition, greatly enlarged and improved, of this gentleman's large *Treatise on Mensuration*. Also the *Compendious Measurer*, for the Use of Schools, price 3s. 6d. by the same.

cellany). Put $m = \frac{3b^2 + 2ab + a^2}{b^2 + ab + a^2}$; then $\frac{ac + dx}{\sqrt{x^2 - c^2}} = \frac{m\sqrt{x^2 - c^2}}{4}$

which equation reduced, and the root found, it gives $x = \frac{2d}{m} +$

$\sqrt{c^2 + \frac{4ac}{m} + \frac{4d^2}{m^2}} = 22.5658 = AH$, and hence $\sqrt{x^2 - c^2}$
 $= 22.415738 = BG$, the length of the frustum required.

The same answered by Mr John Dalton.



It is evident that the block can only rest in equilibrio when its centre of gravity is supported; that is, when the needle produced would pass through the said centre; and that its under surface must also be parallel to the horizon. Now to find the centre of gravity, put CP the perp. height of the whole pyramid $= x$; then from the data will EP the frustum's length $= \frac{1}{3}x$, and the solidities or weights of the frustum and remaining part, will be as 19 to 8. Then if on CP there be taken $CH = \frac{2}{3}CE = \frac{1}{3}x$, and $CK = \frac{2}{3}x$, the points H and K will be the centres of gravity of the upper part and whole frustum respectively; and then, by mechanics, $19:8 :: HK$ or $\frac{1}{3}x:KG = \frac{2}{19}x$ the distance of the centre of gravity of the frustum from that of the whole pyramid; whence $CK + KG = CG = \frac{65}{76}x$. Again, $PB^2 = 9^2 - \frac{1}{4}$ of $9^2 = 60\frac{3}{4}$; theref. the slant side $CB = \sqrt{60\frac{3}{4} + x^2}$, and CS the dist. of the needle from the vertex $= CM + MS = CS = \frac{2}{3}\sqrt{60\frac{3}{4} + x^2} + 12$; and hence, by similar triangles, $CP:CB :: CS:CG = \frac{60\frac{3}{4} + x^2 + 18\sqrt{60\frac{3}{4} + x^2}}{\frac{3}{2}x}$. This value being equated with that found above, and reduced, gives x in a quadratic; and when solved $x = 67.2$. Whence the length of the block $= 22.4$ inches.

IX QUESTION 886 answered by Amicus.

Let t = the time wherein a sum P = all the present worths would amount to s = the sum of all the debts, and R = the amount of 1 pound in one year; then by the nature of compound interest $PR^t = s$, and conseq. by the nature of logarithms $t = \frac{1.s - 1.P}{1.R}$, whence the whole is manifest.

The same answered by Mr Thomas Todd.

(Insert d verbatim, as the author desired).

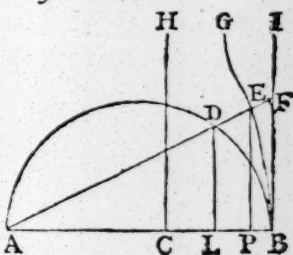
If x = time from the first term to the equated time, then $t - x$ = time from the equated time to the last term, s = sum of debts and p = sum of all the present worths, and the rest of the notation as given in the question; then by Old method, we have $a + b + c + \&c. + m \times r^{t-x} = ar^{t-n} + br^{t-n'} + cr^{t-n''} + \&c. + m$, the whole divided by r^{t-x} , transforms it into Mr Kersey's method, $a + b + c + \&c. + m = r^x \times ar^{-n} + br^{-n'} + cr^{-n''} + \&c. + mr^{-t}$, or $pr^x = s$. $x = \log. \text{ of } s - \log. \text{ of } p$

$\frac{\log. \text{ of } s - \log. \text{ of } p}{\log. \text{ of } r}$ the time fought. And lastly, by Malcolm's method, we have the sum of interests $a r^{x-n} - a + b r^{x-n'} - b + \&c.$
 $=$ sum of discounts $m - \frac{m}{r^{t-x}} (m - m r^{x-t}) + \&c.$ which by transf-

position gives $a r^{x-n} + b r^{x-n'} + c r^{x-n''} + \&c. + m r^{x-t} = a + b + c + \&c. + m$, or $p r^x = s$, $\therefore r^x = \frac{s}{p}$, $\therefore x = \frac{\log. \text{ of } s - \log. \text{ of } p}{\log. \text{ of } r}$ the very same as given above.

X QUESTION 887 answered by Amicus.

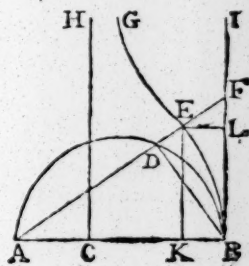
Draw EP and DL parallel to BI . Then
 since, by the quest. $AC:CE::DE:EF$, by
 sim. tri. $AC:CE::LP:PE$, and $AB:CB::$
 $LB:PB$, or $AB:LB::CB:PB$, or $LB:$
 $AL::PB:CP$. But $LB:AL::DB^2 =$
 $LB.AB:AD^2 = AL.AB::EP^2:AP^2::$
 $PB:CP$. That is, $EP^2.CP = PB.AP^2$
 $= CB - CP . AC + CP^2$, which is Sir
 Isaac Newton's equation of the 4th species.



The same by Mr John Farey, the Proposer.

The lines being drawn as in the question, from E let fall the perpendiculars EK and EL , and draw DB . Put $AC = n$, $CB = m$, the abscise $CK = x$, and ordinate $EK = y$. Then

$$\begin{aligned} & \sqrt{n+x^2+y^2} = AE, \text{ and } AK : KB :: AE : \\ & \frac{m-x}{n+x} \sqrt{n+x^2+y^2} = EF, \text{ also } AE : AK \\ & :: AB : \frac{n+x \cdot n+m}{\sqrt{n+x^2+y^2}} = AD, \text{ and hence } AE \end{aligned}$$



$AD = DE = \frac{\sqrt{n+x^2+y^2} - \sqrt{n+x^2} - \sqrt{n+x} \cdot \sqrt{n+m}}{\sqrt{n+x^2+y^2}}$. Then take, as per
 question, $AC : CB :: DE : EF$, or $AC \cdot EF = CB \cdot DE$, that is
 $n \cdot \frac{m-x}{n+x} \sqrt{n+x^2+y^2} = m \cdot \frac{\sqrt{n+x^2+y^2} - \sqrt{n+x^2} - \sqrt{n+x} \cdot \sqrt{n+m}}{\sqrt{n+x^2+y^2}}$, which
 equation reduces to $xy^2 = m - x \cdot n + x$, or $xy^2 = -x\{ \frac{m}{-2n} \} x^2$
 $\frac{1}{-nn} \} x + mn^2$, an equation belonging to the 44th species of Sir
 Isaac Newton's curves.

XI QUESTION 888 answered by Mr Isaac Saul.

The length of the stick, or slant side of the cone, being 5, and the
 radius of its base 3 feet, therefore $\sqrt{5^2 - 3^2} = \sqrt{16} = 4$ is the al-
 titude of the whole cone described by the stick. But the centre of
 oscillation is at $\frac{2}{3}$ of the length of the stick, and therefore $\frac{2}{3}$ of 4, or $2\frac{2}{3}$
 is the altitude of the cone described by the part to the centre of oscil-
 lation, which call a . Then, by page 243 of Simpson's Fluxions;
 $3 \cdot 14159 \sqrt{\frac{2a}{16 \cdot \frac{1}{2}}} = 1'' \cdot 809066$ is the time of one revolution of the
 stick; conseq. $1 \cdot 809066 \times 7 \times 1142 = 14461 \cdot 7$ feet, or 2 miles and
 $1300\frac{1}{2}$ yards, is the direct distance of the cloud as required.

The same answered by Allenfis.

The slant side of the whole cone being 5, and the radius of its base
 3 feet, therefore $\sqrt{5^2 - 3^2} = \sqrt{16} = 4$ is its altitude; and because
 the centre of oscillation is at $\frac{2}{3}$ of the length of the stick; therefore
 $\frac{2}{3}$ of 4, or $2\frac{2}{3}$ is the altitude of the cone above the centre of oscillation,
 which call a ; also $n = 3 \cdot 1416$, and $p = 16 \cdot \frac{1}{2}$. Then, by prob. 9,
 Emerson's Centrip. Forces, we have $n \sqrt{\frac{2a}{p}}$ = the periodic time of one
 revolution. And as sound flies at the rate of 1142 feet in one second,
 and the stick made 7 revolutions from the instant of seeing the light-
 ning, till the report of the thunder, we have $n \sqrt{\frac{2a}{p}} \times 7 \times 1142 =$
 $14461 \cdot 67$ feet = 2.739 miles, the distance of the thunder cloud
 required.

XII QUESTION 889 answered by Mr Alexander Rowe,
of Reginnis.

Since the fluxion of the logarithm of any quantity is equal to the fluxion of that quantity divided by the same quantity; if the quantity be $x + c$, where c is a small given number, the fluxion of it is \dot{x} , and the fluxion of its logarithm is $\frac{\dot{x}}{x+c}$, which, by dividing the numerator by the denominator, is

$$\frac{\dot{x}}{x+c} = \frac{\dot{x}}{x} \pm \frac{c\dot{x}}{x^2} + \frac{c^2\dot{x}}{x^3} \pm \frac{c^3\dot{x}}{x^4} + \frac{c^4\dot{x}}{x^5} \&c;$$

then taking the fluent of every term, we have the

$$\log. \text{ of } x \mp c = 1. x \mp \frac{c}{x} - \frac{c^2}{2x^2} \mp \frac{c^3}{3x^3} - \frac{c^4}{4x^4} \&c.$$

Now if we take the four numbers mentioned in the question to be $x - \frac{3}{2}$, $x - \frac{1}{2}$, $x + \frac{1}{2}$, $x + \frac{3}{2}$, which have the common difference 1; then making c successively equal to $-\frac{3}{2}$, $-\frac{1}{2}$, $\frac{1}{2}$, $\frac{3}{2}$, the above theorem for the log. of $x \mp c$ will give these four logs. viz.

$$1. (x - \frac{3}{2}) = 1. x + m \times (-\frac{3}{2x} - \frac{9}{4.2x^2} - \frac{27}{8.3x^3} - \frac{81}{16.4x^4} \&c)$$

$$1. (x - \frac{1}{2}) = 1. x + m \times (-\frac{1}{2x} - \frac{1}{4.2x^2} - \frac{1}{8.3x^3} - \frac{1}{16.4x^4} \&c)$$

$$1. (x + \frac{1}{2}) = 1. x + m \times (+\frac{1}{2x} - \frac{1}{4.2x^2} + \frac{1}{8.3x^3} - \frac{1}{16.4x^4} \&c)$$

$$1. (x + \frac{3}{2}) = 1. x + m \times (+\frac{3}{2x} - \frac{9}{4.2x^2} + \frac{27}{8.3x^3} - \frac{81}{16.4x^4} \&c)$$

where m is the modulus of the system of logarithms. Then, taking the successive differences of these logarithms, the third difference

$$\text{is } 6m \times (\frac{3^2-1}{3.23x^3} + \frac{3^4-1}{5.25x^5} + \frac{3^6-1}{7.27x^7} + \frac{3^8-1}{9.29x^9} \&c)$$

$$\text{or } 2m \times (\frac{1}{x^3} + \frac{3}{2x^5} + \frac{39}{16x^7} + \frac{05}{48x^9} \&c).$$

Now, by the quest. $a = x - \frac{1}{2}$, and p or $\frac{a+2}{2a+1} = \frac{2x+3}{4x}$; theref.

$$pa^3 - \frac{1}{2} = \frac{16x^4 - 24x^2 - 3}{32x}, \text{ and } \frac{m}{2pa^3 - \frac{1}{2}} = \frac{32mx}{16x^4 - 24x^2 - 3}$$

$$\text{is } = 2m (\frac{1}{x^3} + \frac{3}{2x^5} + \frac{39}{16x^7} + \frac{189}{48x^9} \&c),$$

which agrees with the series for the 3d dif. except in the last term, in

which it differs from it by only $\frac{2}{3x^9}$ which when x is $= 100$, will have

cyphers in the first 18 places of decimals, and a 6 in the 19th place, to multiply by m the modulus.

XIII QUESTION 890 answered by Amicus.

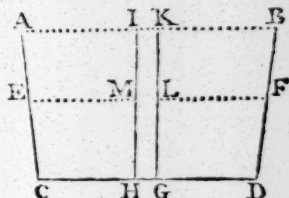
In this question, if the angle of vibration be of any considerable magnitude, the final equation will involve second fluxions squared when freed from surds, and be so complex, as to render the separability of the unknown quantities in a manner hopeless. But if they be exceedingly small, let b = the versed sine of the arc of vibration to the constant radius = a = the length of the string, x = the part of that versed sine answerable to the vertical descent in the vibration of the left body during the time t , gravity = $32 \frac{1}{6} = 2s$, u = the distance of that body from the pulley at the end of that time, and v = the velocity in the direction of the string; putting $m^2 = \frac{w + \tau v}{w - \tau v}$, then by the nature of motion, and the question $v \dot{v} = -\frac{2s}{m^2} \dot{u}$ nearly, and $v = 2\sqrt{\frac{a-u}{m^2}}s$. But the vibrating velocity of the body perpendicular to the string = $2\sqrt{s}x$, and the space described with that velocity = $\frac{\dot{x}\sqrt{u}}{\sqrt{2b-2x}}$, hence $t = -\frac{\dot{u}}{v} = -\frac{m\dot{u}}{2\sqrt{s(a-u)}} = \frac{\dot{x}\sqrt{u}}{2\sqrt{2s}\sqrt{bx-x^2}}$, $t = \frac{m\sqrt{a-u}}{\sqrt{s}}$, and $-\frac{m\dot{u}\sqrt{2}}{\sqrt{au-u^2}} = -\frac{\dot{x}}{\sqrt{bx-x^2}}$; let A = the arc whose versed sine = $\frac{2x}{b}$ to radius 1, B = that to versed sine $\frac{2u}{a}$, and $p = 3.14159$, then the equa. of the correct fluents is $p - B \cdot m\sqrt{2} = A$, from which equation the value of x and $\sqrt{bx-x^2}$, answering to any value of u , becomes known, shewing the nature of the track of the weight. And when the string becomes vertical, $A = p$, at which time therefore the arc B becomes given and = $p \times \frac{m\sqrt{2}-1}{m\sqrt{2}}$, whose versed sine $\frac{2u}{a}$ gives u the length of the vibrating string when vertical; let this value of $u = e$, then in the same manner as before it will be found that at the end of one whole vibration, the arc whose versed sine is $\frac{2u}{e}$, to radius 1, is = $p \times \frac{m\sqrt{2}-1}{m\sqrt{2}}$, conseq. $\frac{2u}{e} = \frac{2e}{a}$, and $u = \frac{e^2}{a}$ = the distance of the left weight from the pulley at the end of one vibration, and the time of one whole vibration = $\sqrt{a} + \sqrt{e} \times m\sqrt{\frac{a-e}{sa}}$, as required.

This question was also answered by Messieurs Cullyer, Howard, Rowe, and Mr Mudge, the proposer, whose ingenious solution we shall insert.

XIV QUESTION 891 answered by Lieut. Wm. Mudge,
of the Royal Artillery.

I apprehend the numbers expressing the breadth of the ditch at top and bottom, have been interchanged; I shall therefore change the dimensions, and take the ditch as widest at the bottom. Let therefore

ABDC be the end of the ditch, and GHIK the cut; put $x = HM$ any variable altitude of the water within, and $g = 16\frac{1}{2}$ feet; by the data $HI : HM :: AE - CD : EF - CD = \frac{2}{9}x$, therefore $EF = CD + \frac{2}{9}x$



$= 30 + \frac{2}{9}x$, and hence $30 + \frac{2}{9}x \times 1$ mile

$= 30 + \frac{2}{9}x \times 5280$ the area of the surface of the water when it is at EF; and the quantity running through the cut GM is equal to $\frac{2}{3}$ of what would run through an equal aperture with the greatest velocity, or that at GH, which velocity is equal to that of a heavy body falling through MH or x , namely $2\sqrt{gx}$, that is, the quantity per second running through MG is $\frac{2}{3}MG \times 2\sqrt{gx}$ or $\frac{8}{3}x\sqrt{gx}$; and hence, dividing this quantity by the surface of the

water at EF, the quotient $\frac{1}{440} \times \frac{x\sqrt{gx}}{135+x}$ will be the velocity v per second with which the surface of the water descends; therefore, by uniform motions, $v : -\dot{x} :: 1'' : t = \frac{-\dot{x}}{v} = \frac{-440\dot{x}}{\sqrt{g}} \times \frac{135+x}{x^{\frac{3}{2}}}$ the

flux. of the time of exhausting. And the correct fluent of this, it being nothing when $x = 9$, is $\frac{880}{\sqrt{g}} \times \frac{135-x}{\sqrt{x}} - 42 = t$ the time of exhausting till the depth is x . And when $x = 1$ inch, or $\frac{1}{12}$ foot, this expression gives $t = \frac{880}{\sqrt{193}} \times 1619 - 84\sqrt{3} = 93338$ seconds $= 25$ hrs. 55 min. 38 sec. the time required.

Had the dimensions been as in the question, or the ditch narrowest above, by a similar process the time of exhausting to one inch deep would be 98330 seconds, or 27 hrs. 18 min. 50 sec. And the time of a complete exhaustion, in both cases, is infinite.

Note. This solution is on the supposition that the velocity of issuing water is equal to that acquired by a body in falling through the whole height of the surface above the orifice.

XV or PRIZE QUESTION answered by Amicus.

The general equation of the redundant hyperbolas having one diameter only is

$$xy^2 = c \cdot x + e \cdot b + x \cdot d + x = cx^3 +$$

$$c \cdot e + b + d \cdot x^2 + c \cdot bd + e \cdot b + d \cdot x +$$

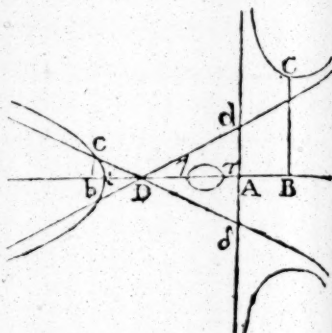
$$cebd, \text{ where } AB = x, CB = y, Ab =$$

$$-x, At = e, Al = b, Ar = d, DA =$$

$$\frac{e + b + d}{2}, \frac{Ad}{AD} = \sqrt{c}, \frac{CB}{DB} = \frac{y}{x + DA},$$

which at the point where the curve

$$\text{cuts the asymptote} = \frac{Ad}{AD} = \sqrt{c} =$$



$$\frac{y}{x + DA}; \text{ this equation reduced is } x = \frac{4ebd}{c - b - d - 4bd}, \text{ for the}$$

value of the abscissa at the point where the curve cuts the asymptote. Hence it appears, that so long as $e - b - d$ is greater than $2\sqrt{bd}$, this value of x will be affirmative, and the two hyperbolas adjacent to b and d will be ambigenous; and since then also e is greater than

$b + d$, theref. e must be greater than DA or $\frac{e}{2} + \frac{b + d}{2}$; consequently

whilst these two hyperbolas are ambigenous, At must also be greater than AD , and that adjacent to D an inscribed one, and the curve of one of the two species discovered by Mr Stirling. But if $2\sqrt{bd}$ be greater than $e - b - d$, the above value of x is negative, and the point of intersection on the contrary side of Ad ; and here DA or $\frac{e + b + d}{2}$

may be either less or greater than At or e according as

$b + d$ is less or greater than e ; if $b + d$ be greater than e , then $e - b - d$ is necessarily less than $2\sqrt{bd}$, and the curves are those drawn in Sir Isaac's 17th, 18th, 19th, and 20th figures. But if e be greater than $b + d$, and $e - b - d$ less than $2\sqrt{bd}$, then must DA be less than At , and the above value of x negative; here then the curve is not as described in those figures, but as in that here annexed, the hyperbola adjacent to D cutting its asymptotes, and then including them within itself, whilst the other two are inscribed ones. If Al and Ar are unequal, the curve has an oval; if equal, a conjugate point. But if they be impossible, or the equation of the curve be $xy^2 =$

$$cx^3 + c \cdot e + b \cdot x^2 + c \cdot a^2 + be \cdot x + cea^2 = x + c \times x^2 + bx + a^2,$$

$$\text{where } a \text{ is greater than } \frac{1}{2}b, \text{ then } -x = Ab = \frac{4ea^2}{4a^2 - e - b^2} \text{ at the}$$

intersection of the curve and asymptote: and if $2a$ be greater than $e - b$, the curve will still be as in the annexed figure, but without oval or conjugate point.

Ex. gr. 1. Let $e = 10$, $b = 5$, $d = 4$; then $Ab = 10.126582$, and $\tau = 1$ = the diameter of the oval.

2. Let $e = 10$, and $b = d = 4.5$; then $Ab = 10.125$, and the oval becomes a point.

3. Let $e = 10$, $b = 0$, and $a = 5$; then $Ad = 9.5$, and $Ab = 10.1010$ &c; $A\lambda$ and $A\tau$ being impossible.

SCHOLIUM. Though these three curves thus differ in figure from those drawn by Sir Isaac for the 10th, 13th, and 14th species, they cannot, with propriety, be said to constitute new ones; for they are all included in his descriptions of those species; which descriptions will equally hold for these, word for word, and letter for letter. Moreover, the two species discovered by Mr Stirling ought not to follow Sir Isaac's 14th, but the first of them ought immediately either to precede or follow Sir Isaac's 10th, and the second his 13th species.

The QUERY answered by Terricola.

Let G be the centre of the burning glass, whose breadth is AL , and focal length GF ; and let o be the centre of the sun, and sv the extremities of his diameter which is at right angles to the line GO . Produce GO to F , and draw IFM perp. to GF ; also draw the lines SGM , $VG I$ cutting IFM in I and M . Then will IM be the sun's image, F that of his centre, and I and M those of the extreme points of his body s and v . But the density of the sun's rays upon the image IM is supposed to be the same as at their incidence on AL , and consequ. $IM = AL$. And the triangles FGM , SGO being similar, $MF : FG :: SO : OG$, whence $2MF = MI = AL : FG :: 2SO = sv : OG$, that is, As the diameter of the glass : is to its focal length :: so is the diameter of the sun : to the distance at which the glass must be placed from the sun, to render the density of the rays in the focus equal to that of the incident rays. Q. E. F.



EXAMPLE. Let the diameter of a burning glass be 2 inches, and its focal length 6 inches. It will be, as $2 : 6 :: 1$ diameter of the sun : to 3 diameters of the sun = 2612000 miles, the distance required.

N. B. Other answers to all the questions, &c. with some new questions, &c. may be seen in the *Diary Supplement*, containing 3 sheets, price only 6d.

NEW QUESTIONS.

I QUESTION 893, by Mr. James Aston, of Harrington.

In what time will an annuity of 83*l.* 10*s.* discharge a debt of 900*l.* allowing interest on each at $4\frac{1}{2}$ per cent.?

II QUESTION 894, by Philalethes Cleasbyensis.

Q of Amsterdam sends to R of Paris 2000 crowns, at 91*d* Flemish per crown, at double usance, or 2 months, and pays $\frac{3}{8}$ per cent. brokerage; with orders to remit him again the value at 93*d* per crown, allowing at the same time $\frac{1}{3}$ per cent. for commission: What is gained per cent. per annum by a remittance thus managed.

III QUESTION 895, by Mr N. Hopkins.

A merchant began trade with a certain sum of money, which amounted at the end of 7 years to 62500*l.* and had accumulated in the following manner, viz. at the end of the 3d year he had just doubled the first sum. The next year he gained the square root of that doubled sum, and 10*l.* more. And the last 3 years he squared the whole. Query the first sum.

IV. QUESTION 896, by Mr John Birch, of Moulton.

Having a conical vessel full of liquor, standing upon its less end, the radius of which is 20 inches, into which I immersed a cone of equal base and altitude, the convex superficies of which is 2827.44, and is equal to the area of the top of the vessel. Required its content, and the quantity of liquor in ale gallons that overflowed by so doing?

V QUESTION 897, by Mr Matt. Terry, Land-Surveyor, of Askrigg.

To determine the ratio of two elastic balls A and B, so that A, by striking B at rest, shall lose one fifth of its motion.

VI QUESTION 898, by Mr Isaac Saul.

Given the curve superficies of the frustum of a sphere, equal to 1600; and the difference between its solid content and that of a cylinder of the same diameter and altitude, equal to 1800; to determine both the diameter and altitude.

VII QUESTION 899, *by Mr Alexander Rowe.*

A bets B 5 guineas to 10 shillings, that in throwing up 5 halfpence, they shall not come up either all heads, or all tails, once in 4 throws: whether has the advantage, and how much?

VIII QUESTION 900, *by Mr William Hardy, of Cottingham.*

There is a geometrical square, whose side is 12 inches, required the radius of a circle, whose centre shall be in the middle of one of its sides, that shall cut the said square into two equal parts.

IX QUESTION 901, *by Mr John Cullyer, of Hingham.*

A carpenter having nearly felled a tree 60 feet high, wishes to be informed at what height he must fix a rope to it, of 70 feet long, that when standing on the ground he may draw the tree down with the most ease.

X QUESTION 902, *by Mr John Farey, of London.*

There is a cubical block of marble, whose side in inches is expressed by two digits; the superficies of the block is equal to 864 times the sum of the said digits, and its solidity is equal to 576 times the square of the sum of the said digits: required the dimensions.

XI QUESTION 903, *by the Rev. Mr John Hellins.*

How many cubical feet of water will freely flow through a circular hole, of one foot diameter, in a board fixed perpendicular to the horizon, in one hour; the surface of the water being kept always level with the top of the hole.

XII QUESTION 904, *by Mr John Bonnycastle.*

It is asserted by Mr Castillioneus, in his Commentary upon Sir Isaac Newton's Arithmetic, that any rational cubic equation of the irreducible case, (as $x^3 - 15x = 3$), will have at least one rational root: it is required to shew the truth or falsity of this assertion.

XIII QUESTION 905, *by Amicus.*

What are the transverse and conjugate axes of the least ellipse, such that a circle whose radius is unity may be the greatest that can be inscribed in any one quadrant thereof.

XIV QUESTION 906, by Mr. Isaac Dalby.

Suppose the earth an Ellipsoid, having the equatorial and polar diameters 6993480 and 6954420 fathoms, respectively: now if a flagstaff be placed perpendicular to the horizon in latitude 50° north, longitude 0; and a theodolite in latitude $49^{\circ} 40'$ north, longitude $10'$ east; what will be the observed horizontal angle, taken with the theodolite, between an object placed in its meridian, and the flagstaff; supposing the flagstaff is long enough to be seen through the telescope when it is horizontal, and its axis 10 feet above the surface of the earth?

XV or PRIZE QUESTION 907, by Lieut. Wm Mudge, of the Royal Artillery.

(Whoever answers it before Candlemas Day, has a chance for 10, and another for 3, Diaries)

It is required to determine the quantity of heat received by the great comet, expected to appear in the beginning of the year 1789; during its passage from the aphelion to its perihelion, the quantity received in one second when at the mean distance of the earth being given equal to 9; and to compare the mean heat of the earth to the greatest heat of the comet when in its perihelion: the period of the comet being 128 $\frac{1}{2}$ years, and its perihelion distance 0.44851, the radius of the earth's orbit being 1:

* * * The prizes for the several solutions have been determined by lot as follows: First, for the Prize Question, to Lieut. Mudge, 10, and Mr John Farcy 8 Diaries.—2d. for the Prize Enigma, to Miss Louisa Amelia Harpur and Mr Wm. Evans each 8 Diaries.—3d. for the general answers to the Enigmas, to Mr Wm Gradidge and Miss Polly Horrija each 8 Diaries.—4th. for the Rebuses, Queries, &c. to Mr John Dutton and Mr James William each 6 Diaries. All of whom will please to send for them to Stationers-Hall.

All letters for the use of the Diary must be directed thus, "The Author of the Ladies' Diary, Stationers-Hall, London." And they must be franked or post paid, or they will not be received; and the last of them must be sent before the first of May.—The gentleman who inquires for eclipses, may find the calculation of them at large in Hutton's Mathematical Miscellany.

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